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THE

JOURNAL

OF

THE ASIATIC SOCIETY

OF

BENGAL.



VOL. I.



THE
JOURNAL

OF

THE ASIATIC SOCIETY

OF

BENGAL.



EDITED BY

JAMES PRINSEP, F. R. S.

SECRETARY OF THE PHYSICAL CLASS, ASIATIC SOCIETY.

VOL. I.

JANUARY TO DECEMBER,

1832.

“It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease.”

SIR WM. JONES.

Calcutta :

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1832.

TO
CAPTAIN JAMES D. HERBERT,

Bengal Infantry,

LATE

DEPUTY SURVEYOR GENERAL OF BENGAL, AND SUPERINTENDENT
OF REVENUE SURVEYS;

AT PRESENT HOLDING THE APPOINTMENT OF
ASTRONOMER TO HIS MAJESTY

The King of Oude:

WHOSE JUDGMENT ORIGINATED; WHOSE PERSEVERANCE AND EXERTIONS SUCCESSFULLY
ESTABLISHED; AND WHOSE SUPERIOR ABILITIES SUPPORTED FOR 3 YEARS,

THE FIRST JOURNAL

IN INDIA

DEVOTED TO THE EXCLUSIVE PUBLICATION

OF

GLEANINGS IN SCIENCE;

THIS VOLUME,

IN ALL RESPECTS, BUT TITLE, A CONTINUATION OF HIS OWN WORK,

IS

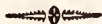
Inscribed,

BY HIS ATTACHED FRIEND,

THE EDITOR.

CALCUTTA, }
January 1, 1833. }

PREFACE.



THE ASIATIC SOCIETY, on the 7th March, 1832*, passed a resolution, that the monthly journal hitherto published under the name of "GLEANINGS IN SCIENCE," should be permitted to assume that of JOURNAL OF THE ASIATIC SOCIETY, and to continue it as long as the publication remains under the charge of one or both of the Secretaries of the Society. This privilege has, as it was anticipated, been the means of extending very considerably its circulation, while it has given a character and authenticity to the work, by its connection with an institution of established literary reputation, which no anonymous magazine, however well conducted, could hope to command.

The advantages of extended circulation have reacted to the benefit of subscribers, by enabling the Editor to increase the quantity of letter press from 400 to nearly 600 pages; and yet so constant has been the growing support of its contributors, that the pages of THE JOURNAL have been devoted, with few exceptions, to the insertion of original communications.

To many readers it would doubtless have been preferable that THE JOURNAL should contain more copious extracts from English scientific periodicals, which are not procurable in the interior of India; but conceding that, as an organ of Indian scientific intelligence, it must obviously derive its only merit among the many similar periodicals of the present day, from its stores of *oriental* literary and physical research, it will be generally acknowledged, that the first object of the work should be to give publicity to such oriental matter as the antiquarian, the linguist, the traveller, and the naturalist may glean, in the ample field open to their industry in this part of the world. While acting

* The January number was not published until the middle of March.— Since then exertions have been made to bring up arrears, and in future each monthly number will appear with regularity on the 10th of the following month; the insertion of the meteorological register rendering an earlier issue impossible.

on this principle, however, the Editor has not lost sight of the great utility of following, as far as means would permit, the progress of the various sciences at home, especially such as are connected in any way with Asia; the only limits thereto being want of space, and want of time to peruse and extract from the vast number of publications of the present day. Want of room also precluded the possibility of republishing the proceedings of the Medical and of the Horticultural Societies; but this had become less urgent since both of those useful bodies adopted the excellent rule of giving early publicity to their own proceedings and records.

To the Asiatic Society THE JOURNAL has naturally looked for its most frequent and interesting communications; and in consequence of its more intimate connection with that Institution, the proceedings of that body have been given in greater detail than heretofore, so that absent members may learn exactly what passes at its meetings, and what accessions are made from time to time to its library and its museum. Many absent members have complained of the quarterly subscriptions they were heretofore called upon to pay, while they remained in ignorance of what was going forward; this source of objection is now obviated, and perhaps a still greater amendment may yet be effected for their benefit, by an arrangement that all members of the Society shall receive a copy of the Journal gratis, which will reduce their annual payments nearly one fourth.

It is unnecessary to recapitulate the contents of the present volume, or to allude in anonymous praise to those who have favored its pages with their assistance; since the authors have, in most cases, on suggestion, permitted their writings to be authenticated by the insertion of their names, as should always be the case in matters of fact, observation, and research. One illustrious name however must not be passed over without a tribute of gratitude for its valued and frequent contributions, a tribute more sincerely paid, since India has now lost the power and the claim to their continuance; she has resigned her most eminent oriental scholar to climes where his talents may find more genial appreciation, but where they cannot excite more respect or admiration, than they will ever command in the land which called forth their energies and directed their application.

The learned Societies at home will be proud to publish the continuation of the *Analyses of the Puránas*, of which the four first have appeared in these pages. Abstracts of four only were ready for the press, but translations of the remainder of the eighteen *Puránas* themselves had been completed under the superintendence of Professor Wilson, before he quitted India.

Mr. Alexander Csoma's indefatigable labour, in opening to us a first acquaintance with the literature of Tibet, will be estimated as it deserves by literary men—a contracted circle perhaps, because deep erudition and study are requisite to form critics capable of appreciating the nature and bearing of his peculiar researches upon the history, languages, and religions of other nations, both ancient and modern. All may however feel sensible of the devotion, zeal, and perseverance, which are necessary to lead a man, alone and unpaid, into a distant and wild country, to learn its language, and study its people at the fountain head. The volumes of notes which Mr. Csoma has presented to the Asiatic Society, will, it is hoped, be published in their Researches at length.

In furtherance of the desire of the Government, the greater part of Dr. Buchanan's Statistics of Dinajpúr has been printed in a detached form, as commenced by the Editor of the *GLEANINGS*; and to complete the work more speedily, two extra numbers have been issued in the course of the year. It will be remarked, that there are many plates referred to in the text: the drawings alluded to are in possession of the Honorable Court of Directors, along with the original manuscripts; it was thought better to preserve the references, in case the Hon'ble Court might hereafter be persuaded to publish them, either in a separate form, or of a size adapted to the present edition. It must not be forgotten, that it is this undertaking which gained to the *GLEANINGS* the valuable privilege of free postage through the Bengal Presidency. The Editor is happy to announce, that the same boon has, in the most liberal manner, and without any solicitation, been extended to the Presidency of Bombay and to the Government of Ceylon, by their enlightened Governors, His Excellency the Earl of CLARE, and the Right Honorable Sir R. W. HORTON, to whom his thanks are thus publicly and respectfully addressed.

To his numerous correspondents, the Editor can but proffer thanks for past, and solicitations for future, support, bidding them remember that, the scope and object of this publication embraces the literature, the manners, the geography, physical and mineral, the arts, the natural productions of Asia, the phenomena of its climate, and observations of the heavens. In the words of the illustrious founder of the Asiatic Society, “the bounds of its investigation will be the geographical limits of Asia; and within these limits its inquiries will be extended to whatever is performed by man or produced by nature.”

Dedicated, by permission, to

LADY W. C. BENTINCK,

A

TREATISE

ON

THE MUSIC OF HINDOOSTAN,

COMPRISING A DETAIL OF

THE ANCIENT THEORY

AND

MODERN PRACTICE.

THE similarity of the music of Egypt and Greece to that of this country has been traced and pointed out: harmony and melody have been compared: and time noticed. The varieties of song have been enumerated, and the character of each detailed: a brief account of the principal Musicians superadded, and the work concluded with a short alphabetical glossary of the most useful musical *Terms*.

BY

CAPTAIN N. WILLARD,

Commanding in the Service of H. H. the Nuwab of Banda.

Price to Subscribers, Sa. Rs. 8.

PROSPECTUS.

A TREATISE on the Music of Hindoostan was much wanted. The scanty information obtainable through the channels of Dr. GILCHRIST and Sir WILLIAM JONES, are neither of themselves sufficient to fill this chasm, nor do they elicit light sufficient to enable one to grope through the various obscure writings in the vernacular languages and dialects. The songs set to music by Mr. BIRD and Mr. WALKIER, are of the more modern style, and not of the ancient school; so that, instead of elucidating the theory, they lead us into confusion, when compared with the tables of Rags and Raginees given by Sir W. JONES.

The forthcoming work has been written with the view of describing in some measure, the theory and practice of the original music of Hindoostan, but chiefly to unfold the beauties of which it is susceptible. The extravagant eulogium offered to the music of ancient Greece, and the striking similarity which appeared to the author to exist between that and the subject to be treated of in this work, has led him to point them out, in the hope that, should a taste for the music of this country obtain among the professors of the science in Europe, it might perhaps conduce to the elucidation and revival of a much-desired and lost branch of knowledge, namely, the music of ancient Egypt and Greece.

For this purpose it appeared to the author, that a bare translation of any of the existing native works would not suffice. All who have been taught music are so much accustomed to the European way of explaining it, that every other must necessarily appear uncouth and preposterous. In the arrangement of this work, therefore, the European system has been adopted.

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PREFACE. A general view of the plan and contents of the work.

INTRODUCTION. Music. Its power on the human mind. That of Hindoostan. The opinion of the Natives with respect to their ancient musicians. How a knowledge of it may be acquired. Not generally liked by Europeans. Reasons assigned for this. Native opinion with regard to its lawfulness. Musical instruments. Relation of music to poetry considered. Progress of music in Hindoostan. The manner of life which should be led to ensure eminence in this science. Cause of its depravity. Date of its decline. The similarity which the music of this country seems to bear to that of Egypt and Greece. How a knowledge of the music of Hindoostan might conduce to a revival of that of those countries. Comparisons offered. Whether the natives of Greece or Hindoostan had made greater progress in music. Comparisons decide in favor of the latter.

HINDOOSTANEE MUSIC. What it is termed in the original. The treatises held in the greatest estimation. Native divisions what, and how many. The arrangement adopted in this work.

OF THE GAMUT. What it is called. The derivation of the word. The subdivisions of tones. Resemblance of these to the Greek diesis. Opinions of Dr. Burney and Mr. Moore on the enharmonic genus. Names of the seven notes. Origin of these. The gamut invented by Guido and Le Maire. Dr. Pepusch. Srooti.

OF TIME. The various measures used in Europe. Difference between them and those of Hindoostan. Their resemblance to the rhythm of the Greeks. Similarity between the Greek and Sungscrit languages. The Hebrew unmusical, likewise the Arabic. Melody and metre considered. Tartini's objections against metre, endeavoured to be controverted. The dignified prose in Sungscrit, and tongues derived from it. Its superiority to the Oordoo. Probable origin of the modern musical measure. Tartini's deduction of measure from the proportions of the octave and its fifth, opposed to the practice of Hindoostan. Whether the rhythmical or the musical measure possesses greater advantages. Opinion hazarded thereon. Time table. Characters for expressing time. Their varieties.

OF HARMONY AND MELODY. The origin of harmony in Europe. Opinions of several learned men on the subject of harmony, with that of the author. Claims of melody.

OF ORIENTAL MELODY. Not generally susceptible of harmony. Limited to a certain number. Its character.

OF RAGS AND RAGINEES. The general acceptance of the terms supposed to be incorrect. Reasons offered, why they are limited to season and time. Of the Rāgmala. Absurdity of limiting tunes to seasons. Divisions of Rags and Raginees into classes. Rules for determining the names of the mixed Raginees. Table of compounded Rags. The Rāgmala copiously described.

OF MUSICAL INSTRUMENTS. Their present state susceptible of much improvement. Their classification. Detailed description of the several instruments now in use.

Of the various species of **VOCAL COMPOSITIONS OF HINDOOSTAN.** Twenty different species described.

Of the **PECULIARITIES OF MANNERS AND CUSTOMS IN HINDOOSTAN,** to which allusions are made in their song. Its characteristic nature. Reasons assigned for several of them, which now no longer exist, and examples produced.

Brief account of the most celebrated **MUSICIANS OF HINDOOSTAN.**

GLOSSARY of the most useful musical terms.

N. B. The work will be printed on superior English paper, at the Baptist Mission Press, Calcutta.

Subscriptions will be received by Mr. A. JEWELL, Moorghehuttah, and Messrs. THACKER and Co. St. Andrew's Library.

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- Page 10 line 9 for "wool," read "wood."
 — 11 — 7 from bottom, for "plate 1, fig. 2," read "plate 2, fig. 1."
 — 14 — last line, for "delomite," read "dolomite."
 — 19 — 16 from bottom, for "3, 4, 5," read "1, 2, 3, 4."
 — 20 — 8 from top, for "plate 1," read "plate 2."
 — 20 — 9 for "he protracted," read "the protracted."
 — — 11 for "BB' B'," read "B' B'."
 — — 16 for "intercepts," read "intersects."

AND

In Fig 2, plate II. continue the dotted arc I' 1 a" to a'.

The line A c' continue to c.

- 28 — 7 from top, for "manima," read "minima."
 — — at bottom, for "Artesien," read "Artesian."
 — 33 — 7 for "January," read "February."
 — 410 — — in last column of Table II. for "2m. 58s. 8," read "0m. 58s. 8."
 — 46 — 18 from top, after "which" insert "comma."
 — — ————— "either" ditto.
 — 47 — 2 from top, for "have," read "has."
 — 57 — 12 for " $99\frac{1}{4} 99\frac{1}{2} 99\frac{3}{4}$," read " $99^1 99^2 99^3$."
 — 59 — 24 and throughout the article, for "sack," read "sac."
 — 60 — 4 "orbitar," read "orbital."
 — — 10 "interval," read "internal."
 — — 29 "lips," read "tips."
 — — 34 dele "by."
 — 60 — 15 for "compressed and hard; before," read "compressed and hard before ;"
 — — 28 for "lips," read "tips."
 — 62 — 11 for "this Chiru," read "the Chiru."
 — 63 — 10 for "bambdoidal," read "lambdoidal."
 — — 14 for "malars," read "molars."
 — 65 — 8 for " $1\frac{1}{8}$," read " $1\frac{3}{8}$."
 — 67 — 2 from bottom, after "than," read "the."
 — 74 — 15 for "9°," read "9'."
 — 75 — 21 dele "rufous," repeated.
 — 79 — 17 from bottom, for "doue," read "donc."
 — 148 — — foot note, for "Rutboo," read "Kubboo."
 — 226 1st par. 5th line for "Ekadantashtra," read "Ekadanshtra,"
 — 226 4th „ 4th — for "Kridama," read "Srid'ama"
 — 229 2nd „ 5th — for "Vrishapati," read "Vrihaspati."
 — 231 — „ 3rd — for "Viswaséna" read "Viswakerna."
 — 238 — „ after "Ganges river," insert "at Gházipur."
 — 245 10 „ from bottom, for "it," read "the mirror."
 — — 1st „ 7th — for "He having," read "Having."
 — 296 line 3 for "but mostly," read "and,—"
 — — 7 for "hydrogen. When," read "hydrogen, where."
 — 305 — 20 for "circumference," read "diameter."
 — — 21 for " $27\frac{1}{2}$ rupees," read " $2\frac{1}{2}$ rupees."

Errata in Meteorological Register, for June.

Date	Hour.	Bar.
13	Sun-rise, for	,365 read ,465
14	„	,399 ,499
22	„	,517 ,617

Add 0,010 to all the figures in the Barometrical column for 10½ P. M.

- 340 — 6 after “*Rhinolphus*,” insert “and two species of *Vespertilio*.”
 — 355 — 13 for “*აკანσα*,” read “*აკანστα*.”
 — 355 — 2 from bottom, after “*nilam*,” insert “*nil mani*, (or *manik*.)”
 — 356 after “College of Fort William,” insert “the word *bahrmani* is also used in the *Khawás-ul-ír*, as a variety of the *yaqút*.”
 — 358 — 20 dele “or a species of garnet.”
 — 358 — 22 for “*manik*,” read *lálri*.”
 — 403 — 5 from bottom, for “*ΔΙΟΚΛΠ*,” read “*ΔΙΟΚΛΗ*.”
 — 404 — 14 for *ΟΥΑ*,” read “*ΟΥΑ*.”
 — 411 — 8 for “Latitude 25° 43’,” read “Lat. 25° 47’ 26”.”

In Table IV. of the Estimate of Life in India, page 284, the first four figures in the second and third column should stand thus :

Age.	Survivors.	Deaths.
20	52221	473
21	51748	489
22	51259	522
23	50737	557

The mistake arose from the calculations having originally been made to commence with the age of nineteen, instead of twenty: and the 5 year averages in Table III. page 283, will all be slightly affected by the same cause. The last figure in the second column, page 284, should be reversed; and in the last column but one, for “2080,” read “2008.”

- Line 414 line 3 from below, for “*molluscæ*,” read “*mollusca*.”
 — 444 — 36 after “ministry,” insert “of a man.”
 — 445 — 3 from below, for “2125,” read “2125.”
 — 446 — 7 for “in bullion,” read “bullion.”
 — 447 — 21 for “will be,” read “would be.”
 — — — after “at any,” insert “rate.”
 — 480 — 15-16 for “*Tariqa-i-Chishita*,” read “*Tariqa-i-Chishtia*.”
 — 483 — 36 for “lost about,” read “tost about.”
 — — — 39 for “*Mújtahid-i-mústaqill*,” read “*Mújtahid-i-mústaqill*.”
 — 485 — 20 for “*Taqwiat-ul-Imám*,” read *Taqwiat-ul-Imán*.”
 — 487 — 15 erase “5” at beginning of line.
 — 488 — 7 for “differences,” read “difference.”
 — 489 — 20 for “*Káfr*,” read “*Kufr*.”
 — 491 — 23-24 for *Isbrák f’il Tasarra*,” read “*Isbrák f’il Tasarruf*.”
 — 492 — 10-11 for “the authority or influence of Saints, as respecting intercessors,” read “respecting the authority or influence of Saints as intercessors.”
 — 498 — 23 for “*Khátim*,” read “*Khátima*.”
 — 501 — 12 after “A B C,” insert “[fig. 5.]”
 — 505 — 20 for “5 53 59,” read “5 52 59.”
 — 506 — 11 for “5 53 10,” read “5 53 27.”



J. H. TASSON DELTA

Horns of the three species of *Jarût* (*Rusa*) inhabiting the Tarai & Saul forest.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 3.—March, 1832.

I.—*Analysis of the Puránas.* By H. H. Wilson, Sec. As. Soc.

[Read at the Meetings of the Asiatic Society.]

1.—*The Agni Purána.*

THE *Agni Purána*, or more correctly, in a derivative form, the *Agneya Purána*, is one of the eighteen principal *Puránas*. Although, in common with the other compositions so termed, it is attributed to *Vyása*, it is narrated as usual by his disciple *Síta*, and was received by him from the *Muní Vasishtha*, to whom it was communicated by *Agni*, whence its denomination.

According to the assertion of its own text, the *Agneya Purána* contains fourteen thousand stanzas; the *Bhágavat* and other authorities give it 15,000 or 16,000. The copy to which this account refers, has about the former number.

The text is divided into a number of small sections, according to the subject, but without any enumeration: the number of them in the present instance amounted to 332. Colonel Wilford speaks of a supplement, and of a chapter, apparently the same, which he calls the 63rd, or last. The supplement, however, from which he derives his account of the modern princes of India up to the *Mohammedan* invasion, is no part of the work to which the name of *Agneya Purána* is applied. It is clearly a distinct and subsequent composition.

The *Agneya Purána* is interesting from the variety of the subjects of which it treats, and in which it deviates very materially from the definition given by its own reputed author of the contents of a *Purána*. These *Agni* declares to be five: primitive creation; subsequent creations; the genealogies of demigods and kings; the reigns of the *Menus*, and the histories of royal dynasties. These however

occur but imperfectly in the body of this work, and the far greater portion of its contents is of a widely different character.

After the usual opening, the *Agneya Purána* describes the ten *Avatáras*, and in the relation of those of *Rámachandra* and *Krishna*, follows avowedly the *Rámáyana* and *Mahábhárat*, being consequently posterior to those works.

The ensuing chapters relate to the worship of *Krishna*, as *Náráyana* or *Vishnú*; this *Purána* being of the *Vaishnava* class: at the same time it leans very favourably to the worship of *Siva*, as the *Linga*, and is full of *Tántrika* ceremonies in honor of that form of the deity. It was compiled therefore probably anterior to any wide separation between the *Saiva* and *Vaishnava* sects, and it was undoubtedly prior to that modification of the *Vaishnava* faith, which pays such infinite veneration to *Krishna* as *Gopála*, or *Govinda*, or *Bála Gopála*, the cowherd or the infant god; no allusion to whose worship has been found, nor has the name of his favourite mistress *Rúdhá* once been encountered.

The ritual, including the ceremonies of the *Homa*, or burnt offering; the *Mantras*, or mystical formulæ; the *Mandalas*, or mystical diagrams; the *Pavitra*, or purificatory thread; the erection and consecration of temples, images, tanks, gardens, flags, jars, &c. extends through a number of chapters; it is in its general purport *Vaishnava*, but the *Linga* and several of the *Tantrika* forms of *Durgá* are also especially revered; *Mantras* are abundantly introduced, as are the acts and gesticulations with which they are muttered or recited. The style in which they are narrated is however abrupt and obscure, and the ceremonial so confusedly and indistinctly laid down, that the whole has the appearance of a string of garbled extracts, rather than of a systematic detail. There is a general correspondence between these chapters with those of the *Sáreda Tilaka* and *Mantra Mahádadhi*, but it does not appear that they are identically the same.

This chapter is followed by the *Bhuvana Kosha*, (the description of the universe,) which corresponds generally with the same in other *Puránas*, but is much less explicit than in some of them. This chapter comprises the *Tirthas*, or places of pilgrimage, of which however it enumerates very few, and those but briefly. It is worthy of notice, that the *Nermadá* and *Sri Saila* are especially noticed, whilst the northern mountains are not mentioned, and also that Benares is called *Avimukta* in its religious character; whence it may be inferred, that the chief shrine was that of *Siva*, as *Avimúkteswara*, not *Visweswara*, the form that has been most popular for some centuries at least. The

site of Benares was the same as at present, or between the *Varana* and the *Asi* rivulets.

The *Máhátmyas*, or legends of the few *Tirthas* noticed, are very brief, except that of *Gayá*, which is so very minute, that it may be suspected to be an interpolation, as it is not in keeping with the rest, nor with the manner in which all such subjects are usually disposed of in a Puránic miscellany. Such interpolations or rather appendages are not at all uncommon, although the legends are more frequently attached to some of the other *Puránas*, as the *Brahmánda* and *Skánda*. We have, however, a case in point with the *Agni Purána*; there being current in the South of India a work called the *Káverí Mahátmyam* of the *Agni Purána*, which is never found in the copies of the *Purána* itself, and which indeed is very nearly as extensive as the whole work of which it is called a section.

The *Tirthas* are followed by the description of the Indian continent, and other portions of the world; also the distances and dimensions of the regions below and above it. The whole of this chapter has not been compared with other works, but in some passages, particularly the description of the sun's car, it is word for word the same with the text of the *Vishnú Purána*: being in other respects, however, much less full and satisfactory than that work.

The description of the sun and planets leads to the astronomical or astrological section, and that to magical rites and formulæ; from these, the work proceeds rather abruptly to the periods of the *Manwantaras*, and then to the civil institutes of the *Hindú* caste, as birth, investiture, marriage, death, &c. the duties of the religious orders, and the contemplation of the deity, conformably to the tenets of the *Vedanta*: a long string of *Vratas* or religious obligations, both special and occasional, follows. The next subject discussed is that of gifts as religious duties, and this branch of the work finally closes with the description of corporeal austerities of a meritorious and pious complexion.

The next portion of the *Agneya Purána* treats at considerable length, and with many interesting particulars, of the duties of princes, beginning with the ceremonies of their coronation, and comprehending their civil and military obligations; it forms what constituted the *Nítí* of *Hindú* writers, (Polity or the art of government,) and is of a character with which *Hindú* ideas have long ceased to be familiar. Some of the details correspond accurately enough with those that occur in a passage of the *Dása Kumára*, and both are probably indebted to a common source: possibly the work ascribed to *Chánakya*, cited by the author of the *Dása Kumára*. As the system is wholly unmixed with foreign notions,

and is purely *Hindú*, it can only relate to a state of things anterior to the *Mohammedan* invasion ; it is not a necessary consequence, it is true, that the *Agneya Purána* should bear a similar date, but it is an argument rather in favour of such a belief, and contributes with other grounds to authorize such a conclusion, if not for the whole work, for a very extensive portion.

The like genuine *Hindú* character belongs to the sections that follow on the shape of weapons and archery, the phraseology and practice of which are no longer known. These sections of the *Agneya Purána* are indeed particularly valuable, as they preserve almost, if not quite, singly, the memory of former regal and martial usages.

The chapters on the subject of judicature and law are so far curious, that they are literally the same as the text of the *Mitákshara*, ascribed to the *Muní Yajnyáwalkya*. The antiquity of that text is, in the estimation of the *Hindús*, extravagantly remote ; but without reference to their belief, it is certainly not very modern, as passages have been found on inscriptions in every part of India, dated in the tenth and eleventh centuries. To have been so widely diffused, and to have then attained a general character as an authority, a considerable time must have elapsed, and the work must date therefore long prior to those inscriptions ; at the same time, this throws little light on the period at which the *Purána* was compiled, the author of which might in any day transcribe the code of *Yajnyáwalkya*, although it is possible, that so undisguised a transfer may have preceded the time at which the legislative code was in general and extended circulation.

The chapters on law are followed by a rather miscellaneous series regarding the perusal of the *Vedas*, the averting of threatened ill-fortune, burnt-offerings, and the worship of various deities. We have then a short but curious chapter on the branches of the *Vedas*, and speaking of the *Puránas*, the following remarkable passage occurs : “six persons received the *Puránas* from *Vyása*, and were his pupils ; their names are *Síta*, *Lomahersha*, *Sumati*, *Maitreya*, *Sinsapáyana*, and *Suvarni*.” These, therefore, are probably the real authors of most if not of all the *Puránas*. It is said also, that *Sinsapáyana* and others compiled a *Sanhitá*, or epitome of all the *Puránas*.

The next chapter on gifts to be made, when the *Puránas* are read, contains the list of the *Puránas* and the enumeration of the stanzas they contain. In this respect many differences occur from similar enumerations in other *Puránas*, and the *Siva Purána* is altogether omitted. With regard to the narrators and the chief subjects at least, in some cases, this detail varies from the text of the works as now found ;

these variations will be best noticed when we come to the respective *Puránas* to which they relate.

The list of the *Puránas* is followed by the genealogical chapters, detailing the families of the Sun and Moon, but more particularly the latter, and especially the houses of *Yádu* and *Puru* to the time of *Krishna* and the *Pándavas*. These chapters agree generally with the dynasties usually detailed, but the lists are for the greater part very dry and abrupt, whilst few of the ordinary legends are preserved, and those so concisely as to be very obscure. There are some details relating to *Krishna* of a rather remarkable character. The time at which these chapters close leaves us no inference regarding the age of the compilation.

The next subject is medicine, taken avowedly from the instruction given by *Dhanwantari* to *Susruta*, or from the medical work attributed to the latter; the extracts are, however, very injudiciously made, with an utter disregard of method; and with a perverse selection of every thing least important: it also alludes to the classification of medicaments as hot and cold, and although it does not attach the same importance to the system as is given to it in *Mohammedan* medicine, yet its introduction at all, is rather in favour of its being derived from such a source, for it is not certain that the ancient writers *Charaka* and *Susruta* laid any greater stress upon these particular properties, than they are entitled to, without reference to a theoretical system. This part of the *Purána* likewise includes much mystic medicine or curing by charms.

Another set of chapters on mystic rites and formulæ follows, and on the worship of different forms of *Siva* and *Devi*. The whole so incompatible with a *Vaishnáva* work that it is difficult not to suppose them additions by other and perhaps later hands.

Poetry and rhetoric form the next subjects, and conform to the systems usually received: the authority of *Pingala* is specified. The work concludes with a grammar, omitting the verbs: the system is that of *Panini* and *Kátyáyana*: the commentator on *Panini* is cited by name. The compilation is therefore posterior to the existence of the great body of *Hindú* poetical compositions, and to the consummation of the grammatical construction of the Sanscrit language.

From this general sketch of the *Agueya Purána*, it is evident that it is a compilation from various works; that consequently it has no claim in itself to any great antiquity, although from the absence of any exotic materials, it might be pronounced earlier, with perhaps a few exceptions, than the *Mohammedan* invasion. From the absence also of a controversial or sectarial spirit, it is probably anterior to the struggles that took place in the 8th and 9th centuries of our era, between

the followers of *Siva* and *Vishnú*. As a mere compilation, however, its date is of little importance, except as furnishing a testimony to that of the materials of which it is composed. Many of these may pretend no doubt to considerable antiquity, particularly the legendary accounts of the *Avataras*, the section on regal polity and judicature, and the genealogical chapters: how far the rest may be ancient, is perhaps questionable, for there can be little doubt that the *Purána* as it now exists, differing from its own definition of a *Purána*, and comprehending such incongruous admixtures, is not the entire work as it at first stood. It is not unlikely that many chapters were arbitrarily supplied about 8 or 9 centuries ago, and a few perhaps even later; to fill up the chasms which time and accident had made in the original *Agneya Purána*.

II.—*On the Poetry of Madagascar.* By the Revd. Mr. Baker.

[Communicated by C. Telfair, Esq. President of the Mauritius Nat. Hist. Soc.]

The most prominent characteristic of the Malagasy language, in reference to Poetry, is a total averseness to rhyme. Whilst it is admitted that the same identical sound is not legitimate rhyme, the extreme paucity of the language in terminations will ever preclude the introduction of rhyming verses. At least nineteen-twentieths of the whole vocabulary of words terminate in *a* or *y*, and an immense proportion of these in *na* and *ny*:—all other words terminate in *e*, or *o*, or the diphthongs *ay* and *ao*; and even these are exceedingly monotonous in the consonants of their penultimate and ultimate syllables. The best couplet I recollect to have heard has the rhyme of *hoē* and *mē*, answering exactly to the English words, *way* and *may*, and the jingle of such a rhyme has in the Malagasy language an unnatural and harsh effect. In the genuine native verses I have not met with any such instance as the one specified, but have observed that rhyme of every description seems naturally from the true genius of the language, and intentionally from the uncouthness of its effect, inadmissible.

So far I have ventured to assert with confidence, and without any apprehension of future observation disproving my opinions:—but when the question arises, what then constitutes poetry or versification in Malagasy? I am conscious that uncertainty and error may very possibly attach to the opinions I shall present in reply. Future observation, combined with a more adequate knowledge of the subject, may disprove my present opinion, and substantiate what I at present reject

as destitute of proof. I make these remarks as introductory to the opinion that *quantity* (except so far as quantity and the number of syllables and accents may be regarded as necessarily synonymous) furnishes no rule for measuring Malagasy verses. No examples have come to my knowledge of lines having a credible claim to correctness, in which two apparently short syllables of one line are put to correspond with one long syllable of an equivalent line; but, where the number of syllables in a line exceeds those of a corresponding line, the metre is preserved by cutting off some syllables; and thence gliding two into one in reading, and by lengthening the half-syllables of verbal terminations into perfect syllables.

Every word in the language is strongly marked by one accent or more, corresponding in this respect with English. But in English it is observable, that the accent, falling on the vowel, leaves the syllable always long, and falling on the consonant, leaves the syllable short. I do not observe any similar distinction in Malagasy, excepting that there are a few words terminating in \bar{e} long, and thence carrying the accent. Probably in Malagasy the accented syllable is universally long, and the long syllable universally accented.

Granting the Malagasy verses to be divisible into feet and capable of being scanned, there is perhaps no instance to be found of a line corresponding with a line in Latin. In Latin, the number of syllables varies, and the last is deemed long; the reverse of these two cases is the fact with regard to Malagasy. Moreover the feet, constituting a line, seen to have no correspondence with the purest metres in Latin. Thus the most harmonious lines in Malagasy coincide syllable for syllable and accent for accent with the following:

“ Tsỹ hitã não vã nỹ mãtỹ	Dost thou not see the dead
Mãràinã tsỹ mbã mãmĩndrõ.”	Morniug not warm at the fireside.

Consisting of an amphibrach, trochee, and amphibrach. These the natives regard as the most harmonious lines; yet there are in the same ode lines quite different in respect to the situation of the accented syllables; as in the following couplet:

“ Tsỹ mãhãlãlã hãvãn’ kõ tõngã	Not knowing what kindred shall come
Aĩzã nỹ õlõnã ìrẽnỹ.”	Where are people <i>as</i> these?

Lines which, notwithstanding their diversity, do not appear essentially destitute of harmony.

These lines have more similarity to English, so far as that a certain uniformity of syllables and accent is essential in both languages; and

the harmony of the verse arises from the accentuation and the cæsure. The latter seems plainly discernible in Malagasy, as in this line :

“ Vāvāhādỹ hĩdĩrānā—mĩsỹ hiānỹ,”
(A door of entrance—that there is.)

Yet the verses are unlike to English in respect to their being destitute of rhyme, unaccented on the last syllable of a line, and scarcely, if ever permitting one line to run on in a continuous sense into another.

The characters peculiarly essential to Malagasy versification seem to be chiefly the following :

1. Harmony of syllables and accentuation ; a deviation from which rule produces a precisely similar harsh discordant effect on the ear as in English.

2. The expression must be diversified, and the words transposed, as in other languages.

3. Every line must be in some degree an independent sentiment ; or at least a clause of a sentence, bearing a natural division in the sense, and thence a pause of the voice in reading or singing. Hence the sense is often strikingly abrupt and laconic, as will be seen in the examples of literal translation.

The language abounds much in polysyllables ; there are exceedingly few monosyllables, and perhaps the greatest proportion of the words are of five syllables. Hence a line of eight syllables generally contains from two to five words, and a line of twelve is frequently comprised in four words. On this account a sentiment is rarely attempted to be set off with superfluous ornaments of language, but stands entirely on the merit of the figure under which it is conveyed. Of poetical adjectives, so often highly convenient in English for filling up the metre or adorning a graceless noun, scarcely an instance occurs in an entire song. Yet the language, thought, and style of the poetry is quite of a different cast from prose. Abounding in the boldest figures, and the sense left to connect itself by the chain of thought, it commends itself to the mind as the rude and unpolished offspring of poetical genius.

It is evident, that in a language so exceedingly different from English, combined with a state of society equally different, it is impossible, on the one hand, to give an intelligible literal translation, leaving the reader's imagination to fill up the images ; and on the other hand, it is difficult to give a vivid imitation of the original. For myself, I pretend not to any talent in poetical composition, and am induced to make the attempt merely by the novelty of the subject, until some more able pen shall display in language more worthy of its subject the gleanings of

orally preserved versification to be found in Madagascar. In the mean time, I have only to plead for all deficiencies, that I am not setting forth myself as an author, but only as a translator, and that from a language wherein nothing can be looked for rising above mediocrity in the estimation of cultivated minds. I shall be abundantly requited for my trouble, should these contributions tend in any measure towards evincing that the native inhabitants of Madagascar, degraded as they actually appear, especially when contrasted with the enlightened population of civilized Europe, are nevertheless not destitute of natural genius, nor by any means insensible to the finer feelings and passions of human nature.

I ought not to conclude without observing, that there is a kind of composition very prevalent in the language which is neither perfect prose or poetry, but seems to form a connecting link between the two, being both in sentiment and expression more pithy, figurative, and smart than the former, and yet destitute of the metre, cadence, &c. of the latter. These pieces may be called poetical prose. A prose translation of such fugitive examples as have fallen into my hands would be dull and unstriking, and a *literal* rhyming translation impossible; so I have chosen in the accompanying example "on courtship," a translation pretty free in expression, but I believe perfectly correct, though somewhat paraphrased, in thought*.

It appears, as far as I have discovered, that all compositions, in Malagasy, of a poetical turn of thought, are written in this style, except songs; the latter being the only compositions I have yet met with evidently written in regular metre.

The following, as well as several succeeding songs, are by a man called Razafiláhy, who happening to be a cripple, and unable to work, turned his attention to song-making, by which it is said he obtains a tolerable livelihood. He is a stoutish man, rides out on the back of a male slave, and has as buxom and merry looking a face as any to be seen in Madagascar†.

* We are inclined to differ in opinion with our author on this subject, and to think that a mere literal translation with explanatory notes, would have better illustrated the peculiarities of thought and idiom in the Malagasy language, than even the best versified imitation.

† As more convenient for the generality of our readers, whom we may safely presume to be unacquainted with the Malagasy language, we have arranged the original text at the foot of the page, leaving the English version uninterrupted.—ED.

I.—*Literal translation of an Ode in praise of the Prince Rabódo.* By Razafiláhy.

Long, long, may live
 Rabódonandrianampóina :
 To the South is Ambátondrafándana*,
 To the North Ambóhimitsimbina*,
 To the West Ambóhimiándra*,
 To the East Ambóhijanaháry* ;
 [He is] The full moon shining in the west,
 The rising sun rising in the east.
 Long live Rabódo,
 Yea Rambóasaláma,
 And Rakótosehéno na Radáma,
 And his relations all,
 Innumerable they ;
 The portions of land shall then be dollars,
 The corners of the houses guns ;
 Endréhinantsíva is his portioned land,
 Endréhinantsiva his house ;
 Possessing much, yet not haughty.
 Orphans shall then be plump [with health],
 Their mother living, then they well fed.
 Yonder is the defence of rock,
 Yonder the clothing of wood,
 A fence of spears, yea second fence of men,
 Long live Rabodonandrianampóina.
 A single tree in a lake—
 It is not “ how many reign ? ”
 For *there* is our only master.

I. *Ode in praise of Prince Rabódo.*

Hono re ny veloma	Ny zoro n'trano dia basy
Rabodon and rianampoina	Endréhinantsiva ny tokotany ny
Atsimo n' Ambatondrafandana	Endrehinantsiva ny trano ny
Avaratry ny Ambohimitsimbina	Manambe tsy'mba miavona
Andrefana Ambohimiandra	Kamboty, dia dongadonga
Atsinanana Ambohijanahary	Velon'dreny dia botrabotra
Volana tsinana ny avy andrefana	Ao ny miaketso vato
Feno manana ny avy atsinanana	Ao ny miakanjo hazo
Veloma Rabodo	Rova lefona ka temitr' olona oindray
Sy Ramboasalama	Veloma Rabodonandrianampoina
Sy Rakotoseheno na Radama	Hazo tokana an-ory
Sy ny havany tontonlo	Tsy firy no mandidy
Tsy tambo isaina,	Ka tompo nay any ao.
Ny tokotany dia farantsa	

* Name of a village, which like all others in Imerina, standing on a hill, is a poetical object. These villages being conspicuous objects, lying to the North, South, &c. of Tananarivo, the prince's residence.

The following is the translation of another Ode by the same author.

II. *The Great River.*

Yonder Ambaniála's* streams go forth,
 Ambóhidrapéto† to the north extends,
 To the northward also Ambóhitrimanjaka ;
 ‡ " Guide well thy winding course,
 Nor kill the people's sons with heedless might.
 Too full, thou'rt like an ill-cut cloak,
 Smothering the head it should set off.
 Dried up, thou'rt like an insufficient dress,
 Leaving the breast and arms naked.
 And thus from day to day
 Thou rollest onwards continually.
 Soon at Iki'opa are thy waters found ;
 Iki'opa renowned through the world,
 Devouring all, yet still unsatiated||,
 Lab'ring ever, and still thy work unaccomplished ;
 Ambohiboánjo from thy bank not far,
 And southward Soavinimérina ;
 Behold Antânta abounding in eels,
 § From whence murmuring sounds are heard ;
 The soldier here casts round his wandering eye
 Thinking of distant friends.
 Here thou art in jeopardy, new-wedded bride,
 Should a dispute arise towards the evening ;
 For caprice controls the unsettled heart.
 Discarded, thou wilt soon retrace thy steps !
 But we again pursue the river's course

II. *Anonibe.*

Indro ny rano Ambaniála
 Avaratr' Ambohídrapeto
 Avaratr' Ambohítrimanjaka
 Mahaíza mandeha
 Mahaíza mizotra
 Aza mamono zana' bahoaka
 Tondraka, toa misaron' doha
 Ritra, toa inanao sikimbalaka
 Ka ny azy re toetr' andro ny
 Ka mivalambalan' indray
 Koa man kany Ikiopa

Ikiopa rano malaza
 Homambe fa tsy voky
 Mivalambalan' indray
 Mivalana dia any Ambohiboanjo
 Any atsimo ny Soavinimerina
 Indro koa re any Antonta
 Ka migodongodom' piteny
 Mahita anay lavi'kavana
 Miady, mena masoandro
 Ka tsy fantatr' ompanavao
 Tsy vatra n'olona tsy honina

* This and others are names of villages lying far above the banks of the river.

† The whole beauty of the poem lies in a hidden allusion running through it to the kingdom ; here perhaps is an admonition to the sovereign.

‡ All other streams run into Ikiopa.

§ That is, the sound of the distant waterfall, and by allusion, the repining of the soldiers going to war.

At Farahantsana next abide :
 The people there with noisy long guns fire,*
 And cannons, longer, and still more noisy :
 Spitting the frothy foam and rising phlegm
 Writhing in restless agony and pain†
 Let each unwept forsake his best beloved!
 For all partake the bitter curse.‡

III. *Paraphrase of a poem called Ny Momba, or the Barren.* By the same Author.

1 To thee who dost all childless live,
 Thou barren, this advice I give ;
 ' In place secure thy wealth with foresight lay ;'
 For then a thousand tongues thou'lt find to say,
 " Kind father, dearest mother, thou to me :"
 No space their coming stays,
 No rugged road delays.
 But if thou pine in wretched poverty ;
 Not thine gay robes to wear,
 No flattery soothes thine ear,
 No prattling babes entwine,
 No equal portion thine.

Izahay re dia handeha
 Ka tonga tany Ifarahantsana
 Ka ny ao mepoa' basy lava
 Ny ao mipoa' tafondro lava

Mitsipidrora mivalana
 Mamoiza ny man a' malala
 Fa samy efa nozoi'ny.

III. *Ny Momba.*

1 Izany Rakala momba,
 Tehirizo trara ny harena ;
 Fa raba misy ireny,
 Atao ny hoe, ikiaky nao, ineny ;
 Tsy mahalavitra ny tany,
 Tsy mahasasa' mandeha,
 Fa raba tsy manana ireny,
 Lany haingio,
 Lany laingia,
 Lany zanaka.
 Lany zara.

2 Momla lany havena,
 Ny maso no apitrapitra ;
 Tsy misy havan' kamangy,
 Tsy misy zaza hitomany.
 Noana, tsy manan' kangatahana ;
 Voky, tsy manan' kotolorana ;
 Marary, tsy manan' kitsabo,
 Sasatra, tsy manan' kitsetra.
 Eny Ramomba,
 Maty, tsy manan' kitomany.

* Literally true of the Sakalava enemy, and figuratively of the water-fall, Ifarahantsana.

† Under the figure of the dashing of the water, alluding to the death of soldiers through war, fever, and famine.

‡ Every family has lost some relations in the devastating wars, and all must submit without repining.

2 The barren destitute of wealthy store,
 Extends her wandering eyes the wide world o'er.
 No loving friend to visit her is found,
 No children, prattling all their wants, surround.
 If hungry, none a scanty dole shall mete;
 If satiate, none the falling crumbs shall eat;
 By none thy sufferings are allayed;
 If weary none shall give thee aid;
 And, hapless, even when thou'rt dead,
 No tears shall weep o'er thy last bed.

3 Thy shroud not half a dollar buys,
 Nor sixpence sheep for sacrifice,
 A penny pays for grease to light
 Instead of taper thy sad ghost;
 No friends shall watch the dreary night
 To shallow grave shalt thou be hurried,
 And with regardless haste be buried,
 A farthing all thy funeral cost.
 "Ah! mother, life is misery."
 Yea barren, such thy fate must be.
 Thou'lt fain the locust* catch, for whom?—
 For children of a luckier womb,
 Yea such, ill-fated barren, is thy doom.

4 Now barren, view thy husband dead,
 And thou from parent's distant bed;
 From head to foot sorrow's own image thou,
 Unheard by all, thy sad bewailings now.
 Ah! barren, thou in former days,
 A father living,
 A mother giving,
 Couldst bathe in water fetch'd by slaves,
 Caressed and blest in all thy ways.
 Ah barren, now how chang'd thy state,
 Thy father's life-dream o'er,
 Thy mother now no more,
 To bathe in tears thy wretched fate,
 All cloth'd in rags, thou once mightst hate.

3 Vitan' damban' doso,
 Vitan' ondryn' tsikiajy;
 Vitan' tsabora mila voamena,
 Atao ny lavenan' tandrevaka.
 Tsy misy mpiaritory,
 Ialany ny olo kajia;
 Maty re aho raneny;
 Izany Rakala momba
 Misaambo' balala
 Ho an' janak' olona;
 Eny Ramomba

4 Rakala momba, momba ka maty vady;
 Ka lavi' dray aman' dreney;
 Sady an-doha no an-tongotra.
 Miantso ka tsy fanta' ny,
 Ray bado, ray bado;
 Fahavelon' dro ray uey,
 Fahavelon' dro reny;
 Mandro rano autsakaina;
 Raha mivoaka, tambatambazaua;

* The poor among the people eat the locusts, and feed their children with them.

Link'd to some churl, I see in piteous plight
Thee pinch'd and waken'd at the morning light ;
Expelled the cheering hearth, thy wedded right,—

“ Ah, mother, life is misery ;
Would I had died in infancy !”

- 5 I travelled eastward succour to obtain ;
My father's kindred live hard by.
Alas ! I'm chang'd ; they know me not again ;
Ah mother ! like the dead am I.
I turn'd my steps into the northern way ;
My mother's kindred live hard by.
Alas ! I'm chang'd ; thou'rt not the same, they say ;
Ah mother ! like the dead am I.
I turn'd me back again, and southward ranged ;
My father's sister lives hard by.
But she like all my relatives is changed.
Ah mother ; worse than dead am I.
I turn'd again a westward course to tread ;
Tis there my mother's sisters live.
Their dead relation's awful blame they dread,
So careless pitch the boon they give !

IV. *Paraphrase of an Eclogue in Poetical Prose.*—Author unknown.

On Courtship.

- She. Pray tell me, since you oft profess
Your fervent love to me ;
To what, if we may give a guess,
Your love may liken'd be.
He. Rice which affords our daily food,
And constant life supplies,
Is the best emblem of my love,
Which never never dies.
She. Ah no ! not so thy love to me,
For that, thou deemest sweet,
Only when hunger presses thee
To take the proffer'd meat.
Then tell me, since you oft profess
Your, &c. (as in the first verse.)

Ray bado, ray bado ;	Nony nankao avaratr' aho ;
Raha maty ro ray ny,	Havan' dry neny no ao.
Raha maty ro reny ;	Nova'ny ny olon' kafa ;
Mandro rano maso	Maty aho rey neny
Mitafy lamba tseroka,	Noney nankao atrimo aho ;
Mitoetra amy ny olona ny bado,	Zanak' olomianadahy no ao.
Mandry maraina, rongadrongati' ny,	Novany fahatelo be ;
Mamindro, atositosi' ny ny sasany.	Maty aho rey neny.
Maty aho ry neny,	Nony nankao andrefan' aho,
Tsy maty fony kely.	Zanak' olona mirahavavy no ao :
5 No ny nankaroa atrinanana aho ;	Ny tao no manipy kely,
Havau'dry kiaky no ao.	Fa matahotra ny tsiny ny maty.
.. Nodiány ny olona tsy fantatra aho,	
Maty aho ry neny	

- He. I love you as the fountain pure,
Which yields a sure supply
Of that, without whose aid secure
My frame would quickly die.
- She. Ah no ! not so thy love to me,
For that, when dirt adheres
Which others scornfully may see,
Desirable appears.
Then tell me, &c.
- He. The lamba* which around I fold
To guard life's vital flame,
Is that, which, next to thee I hold
Most needful to my frame.
- She. Ah no ! for that when older grown,
Disdain'd, thou wilt reject ;
And ne'er again will it be known,
But lie in long neglect.
Then tell me, &c.
- He. I love thee like the luscious taste
Of a new honey-comb,
Whose precious fruit is seized with haste,
And borne in triumph home.
- She. Ah no ! for there amidst the sweets,
Though luscious they be found ;
The goodness not unmingled meets,
But dregs impure abound.
Then tell me, &c.
- He. I love thee as the sov'reign king
Of this our native land ;
Whose endless praises all can sing,
Whose word moves every hand.
- She. To this, in truth, thy love compare,
Whose merely passing by,
Rebuking every vulgar stare,
Abashes every eye.

IV. On Courtship.

Tia nao tahaky n'inona angaha aho ? Tia ko tahaky ny vany hianao.—Tsy tia nao aho izany, fa atao nao famoujy fo raha noana. Tia nao tahaky n'inona angaha aho ?—Tia ko tahaky ny rano hianao.—Tsy tia nao izany aho fa atao nao fitia momba tseroka. Tia nao tahaky n'inona ary aho ? Tia ko tahaky ny lamba hianao.—Tsy tia nao aho izany fa raha tonta afindra nao ka tsy tsaroa 'nao intsony. Tia nao tahaky n'inona angaha aho ? Tia ko tahaky ny tantely hianao. Tsy nia nao aho izany, fa misy faikana. Tia nao tahaky n'inona angaha aho ? Tia ko tahaky ny Andriamanjaka hianao. Tia nao tokoa aho izany, mandalo, mahamena' maso mijery, mahamenatra :—Tia nao takoa aho izany, fa tapi'java' nirina aho, tapi' java' naleha.—Tia ko tahaky ny kiaky sy neny hianao : veleno, iray trano ;—maty, iray hazo.

* The garment which a Malagasy wraps round his body, and which constitutes his only clothing, except what is wrapped round the loins ; and without which he is called naked.

To him, indeed, thy love compare,
 Whose briefest, transient gaze,
 With shame o'erwhelms, and deep despair,—
 Or drooping hearts can raise.
 To this; indeed, thy love compare,
 I, of desire the end
 And goal; wherever you repair,
 Still towards me you tend.
 And I, my love to thee will prove,
 In all good faith and truth,
 A filial daughter's tender love
 To parents of her youth.
 Enjoying life, while life shall last
 One house our common home;
 And when the mortal scene is past
 United in one tomb!

III.—*Extracts from Dr. Royle's Explanatory Address on the Exhibition of his Collections in Natural History, at the Meeting of the Asiatic Society, on the 7th March.*

Geology of the Dehra Dún.

The low range of hills skirting the Himalaya has a strip of jungle along its south-west base, and the valley of Dehra on the north-east. The highest peaks of this range are probably 3000 feet above the level of the sea, and its outline presents a serrated appearance. The lower strata are composed of a loose-grained sandstone, above which are layers of clay, and gravel-rolled stones are found on the highest peaks; the clay gravel and sandstones are all regularly stratified with the strata dipping to the N. N. E. at an angle of about 30°. From many of the rolled stones being found with their flat sides and long ends parallel to each other, though in different strata, and yet inclined at a considerable angle towards the horizon, it is evident, that they must originally have been deposited in horizontal strata, whence they have been raised into their present inclined position by some subsequent convulsion of nature.

The whole of this range, like the greater part of the plains of India, is impregnated with carbonate of lime; for frequently where the water percolates through the rock, and a favorable situation offers, stalactites are formed, as well as tufaceous limestone, and it is more than probable that the *kankar* of the plains is similarly formed. Lignite was discovered in this range by Captain Herbert, and by Lieutenant Cautley, of which an account has been given by the above two gentlemen. A

writer in the *Bulletin des Sciences Naturelles* concluded, that this range was analogous in formation to the *Molasse* of the Alps. My friend and successor Dr. Falconer, without any knowledge of the opinions of this author, determined on his first visit to the *Kherí Ghát*, that this range was analogous to the *Nagelstuhe*, or *Molasse*, which is equivalent in age to the oldest of the tertiary series of English formations, or plastic clay, together with the London and Paris basons.

The valley of Dehra is elevated 2000 feet above the level of the sea, and is filled up with diluvial debris from at least 220 feet depth below the surface, as is indicated in the particulars of the strata discovered in the sinking of a well shaft by the Honourable Mr. Shore, detailed in the GLEANINGS OF SCIENCE, I. 164.

Discovery of Fossil Bones.

Dr. Falconer, in a letter received only a few days since, informs me, that he accomplished the tour alone, which we projected to have made together, for the purpose of visiting the place where the *lignite* is found in largest quantities. He communicates the very interesting and important discovery of fossil bones at that place: "I returned loaded, not only with lignite, but with *noble fossils of the monsters of the deep! bones of crocodilidæ, fragments of the skull of large turtles, and a fragment of a bivalve shell as large as an oyster.*" The identification of the range will therefore be certain, and we may expect an interesting paper on the subject from Dr. Falconer. It will be most curious to ascertain whether this deposit of organic remains is identical with the sources of the *bijli ke hár* to the north of the great chain of mountains, separated by the up-heaving of the latter; and, moreover, whether both formations are not connected with those of the Irawadí, so productive in magnificent specimens of organic reliquiæ.

Hour of Maximum Temperature in the Hills.

One peculiarity in the hill climate is the early period of the day at which the maximum of heat is attained. In the plains we know, that if horary observations are taken, we find the temperature of the air goes on increasing until 2 or 3 P. M. In the hills, on the contrary, if the same kind of hourly observations be taken, and a fine clear day be chosen, the thermometer will be found to rise rapidly from sun-rise until 10 A. M. when it nearly attains the maximum; the increase after that hour does not amount to more than a degree or so. As the latitude is nearly the same as that of Seháranpúr, the power of the sun's rays and the quantity of heat communicated in a given time, must be nearly the same: but in the plains it is allowed to

accumulate; in the hills, on the contrary, some power must exist which carries off a portion of the heat as rapidly as it is communicated: this power is the breeze which is found daily to set in from the plains towards the hills, which commences about 10 A. M., (the very time after which so little increase takes place in the temperature,) and passing over the top of the range prevents the accumulation of any heat. It might appear, however, that as the atmosphere is heated to so high a degree in the subjacent plains, the effect of a breeze setting in that direction would be rather of a heating than that of a cooling nature; and it would be so, but the air as it ascends becomes less dense, and in proportion to this diminution of density is its capacity for heat increased, so that it is enabled to absorb all that which was sensible to the feelings, or was observed by a thermometer, in the plains; and thus, when it arrives at the top of the range, it feels cool and refreshing. At night a similar but more gentle breeze sets in from the hills towards the plains, and the two may with the strictest justice be compared to the land and sea breezes of the coast.

Vegetable Impressions of the Coal Strata.

On my way to Calcutta by dāk, I visited the coal mines of *Chinakurí* and *Rániganj*, and procured a large collection of vegetable impressions, but I have not yet had time to ascertain whether there be any thing new among the number, though I am inclined to think, that the straight and striated unjointed reed was not among the specimens I saw with Dr. Falconer or the Rev. Mr. Everest. In travelling along the road after collecting these impressions, it struck me, that as the theory of the formation of coal supposes the existence of vegetables in swamps or *jhils* of a former period of the world, at which time many phenomena indicate a high degree of temperature, considerable assistance might be derived in confirmation or refutation of this theory, by examining the plants which now exist in the *jhils* of India, and comparing them with the vegetable impressions which distinguish the coal bason. The subject would lead me into too much detail now, but I hope to be able to follow it up at some future period. It may be cursorily remarked, that all the peculiarities stated by Mr. Conybeare as marking the vegetation of coal fields, may I think, be observed in the vegetation which now floats on the surface of the *jhils* round Calcutta. Their peculiarities are, 1, great length of stem; 2, deficiency of bark; 3, want of consistence in the woody fibre; 4, striated appearance of stem; 5, its frequently jointed nature, with great inequality in the length of the joints; and 6, the absence or smallness of roots. The *Mentha verticillata* displays itself many of these peculiarities: a resemblance

to the vegetable impressions now on the table may be observed, in the small collection of specimens of plants from the *jhils* of the neighbourhood, in my herbarium.

Contents of Natural History Collection.

The packages I am taking home, contain skins of most of the animals of the Upper Provinces and of the hills. The Alpine hare, *Pica* of Buffon, now formed into the sub-genus *Lagomys*, is perhaps the only novelty, as I do not recollect its being enumerated as occurring in the Himalaya in Griffith's Animal Kingdom, the latest systematic work on the subject. The hill fox is nearly twice as large as that of the plains, and in colour and general appearance bears considerable resemblance to the English fox. The drawings of the *Rokar*, or barking deer, and *Dúdhú*, as well as of the Cashmerian goat, may be interesting.

Of the specimens of birds, it may be sufficient to indicate the number of species comprized in the collection.

Of the Accipitrine tribe,	29 species.
Passerine,	115
Scansores or climbers,	35
Gallinaceous birds,	26
Grallæ,	36
Anseres,	21

In all 233 species.

The pheasants, wood-peckers, jays, shrikes, cuckoos, and the falcon tribe, are most numerous in species; the waders and anseres are incomplete, from the difficulty of procuring specimens.

Among the insects of the hills, many genera correspond with those of Europe. The species and genera of shells agree entirely with those described by Mr. Benson, at a late meeting. The above are only a few indications of the Natural History of the northern provinces of India; much remains to be done to get any thing approaching even to a correct Natural History of any of the provinces of India, and it is to be hoped, that many are employed in collecting materials towards the completion of this very desirable object.

Vegetable Philology.

Lycium.—From the roots of different species of barberry, an extract is prepared, which is well known throughout India by the name of *rasót*. In the Persian works on materia medica, *lúfion* is given as the Greek name of *rasót*. This is no doubt intended for the *λυκιον* of Dioscorides, I. 133, as the Persian account is a pretty literal translation of the Greek one, and Dioscorides moreover describes the mode of

making the extract and the plant from which the Indian *λυκίον* is manufactured. Sir J. Smith, in Rees' Cyclopædia, mentions that *Rhamnus infectorius* (Turkey-berry, Buckthorn) is justly considered by Dr. Sibthorp, as the *λυκίον*, *lycium*, of Dioscorides. Under the head of *lycium* however he says, 'the description given by that author does not accord entirely with any known species of *lycium* :' that it was not always so, I conclude from finding that *Lycium Creticum* of Prosper Alpinus is a synonyme of *Berberis Cretica*, which is the Cretan or box-leaved Barberry. Considering, therefore, that a species of barberry was formerly called *Lycium*, and that an extract is now prepared from a species of barberry, to which the Greek name *λύψιον* is applied by the Persian writers, and that the Persian *ف* (ف) may with the greatest ease be substituted for *k* (ق) through the inadvertence of transcribers in writing a foreign word, I think it may safely be assumed that for *لوفيين* *lúfyon*, we should read *لوكيون* *lukyon*, and that consequently the *λυκίον* of Dioscorides is the *rasót* of India, and that the extract was then, as it is now, prepared from a species of barberry.

Peganum Harmala.—This plant is called *húrmal* by the native hakims, and commonly *isband Lahorí*, on account of its being brought from Lahore. It is remarkable, that Dioscorides gives *άρμαλα*, *Harmala*, as one of the synonymes, and *μολυ*, *Moly*, as another. In the Persian works, *hurmál* is said to be the Syrian name, and *moly* the Greek. The plant is now common about Agra, having probably been introduced from the northward.

IV.—On the Utility of Cess-pools in Calcutta.

The accompanying memoranda of observations have been made at different towns and places, on experimental Cess-pools, or receptacles for filth, in use since last hot-weather.

The subject is not one of an attractive nature; there are, however, some circumstances stated which may induce you to give the papers a place in your journal.

The wells that are spoken of in the papers were of perfectly simple and firm construction. They were dug to the greatest depth that the common well-diggers of the country could easily reach, and generally of the greatest breadth, for which *paats* or earthen-ware hoops can be made, viz. 4 feet 6 inches. A parapet of masonry was raised to the height of 4 or more feet, having the same cylinder as the wells, to obviate inconvenience from their overflowing. They have been dug either in the godowns, where conveniences on the old plan already existed, or in

open spots, where they have been properly inclosed and covered. The average expense of constructing the largest sized wells is Rs. 50, small ones can be completed for 15 or 20 Rs.

The well in No. 2, Hare-street, affords a good example of the utility of the plan. It was constructed to receive the washings of the cook-room. For 9 months it has perfectly succeeded, not the slightest smell having ever been perceptible from it; the water in it has stood a few inches only above the water in a neighbouring well of pure water, and the nuisance created by a stream of black fluid, that used to issue from the aperture of the cook-room, and travel, or attempt to travel, some hundred feet through the compound into the public surface drain, has been completely removed.

This is an experiment which may perhaps attract attention; by the same means the occupants of large premises may provide a remedy for a serious inconvenience, that the best conceivable plan of general drainage would very imperfectly reach. The expense of the well was only 19 Rs. Besides the wells adverted to in the annexed papers, there are many others that have long been used in private houses, both in the town and suburbs, with advantage.

In Fort William, and at Chinsurah, they have been greatly approved of, and are in constant use; the state of all has been carefully examined from time to time.

There are in the House of Correction two wells, one used by about 8 European prisoners, the other by about 100 natives. Not the slightest smell is perceivable from either of the wells themselves. The native one was also used as a receptacle for the filth accumulated in the prisoners' cells at night. This was too much for it. About the end of the rains it was nearly filled, and had to be shut up; the fluid in it gradually decreased, and has fallen up to this time to a level of 5 feet below the top; and about $3\frac{1}{2}$ feet higher than that used by the small number of Europeans. A candle has been burnt in it without being in any manner affected.

In the Police Office, there are three wells; these have never been in any way offensive, and the light of a candle burnt in them has not been affected. The following is a report on the subject from Mr. McCann.

“I examined the cess-pools in the Police compound yesterday. The smell complained of, I found owing to an accumulation of filth in the corner, between the raised cylinder of the well and the walls of the godown, in which it (the large one) is placed. I found, on standing over the well itself, that no smell whatever proceeded from it.

“The depth of space free of water or filth in the well, No. 1, was about 3 feet; No. 2, 4 feet; and No. 3, $4\frac{1}{2}$ or 5 feet, on the above date.

“I tried a candle in No. 1, it burned perfectly bright without any explosion.”

In Mírjaní Galí, there are three of the same nature; these have been complained of by the division overseer, who thought they had not originally been dug of sufficient depth, but care must of course be taken that the platforms are kept carefully cleaned and washed.

On the 26th of September, 1831, the well in the cook-room of No. 2, Hare-street, raised $3\frac{1}{2}$ feet above the surface, and having a small opening at top, for the passage of water, secured by a copper strainer, and in use from April, was examined.

There was not the slightest smell to be perceived from it, a candle was let down to the surface of the water without the flame being affected in the slightest degree; it burned as in a common atmosphere. The only effect it seemed to produce was the forcing out by rarefaction of a small quantity of the air in the well, which smelt offensively, but not very much so. The height of the water or filth was precisely the same as in another common well quite close to it.

The liquid at the surface of the water of the well appeared of the blackest and most filthy description; there were creatures like cock-roaches seen swimming among the bubbles, when they were disturbed by the iron to which the candle was affixed.

The following interesting account is given of certain phenomena observed in a kitchen cess-pool at Bythákkhaneh.

Ignis Fatuus.—On the 3rd of June, 1831, I caused a well to be dug at my garden, at the Bythákkhaneh, for the purpose of receiving the refuse water of my kitchen and bottlekhaneh, about twelve feet deep, (at which depth water was discovered,) and three feet broad.

The well was surrounded with the circular earthen *paats* commonly used in the construction of wells in Bengal, and a pukka circular wall about two feet in height, built above the level of the earth, and the mouth of the well covered in with tile work and khoah, the same as a terrace, leaving an aperture to admit the refuse water about nine inches in diameter, closed by a copper strainer, to prevent particles of meat, rice, &c. falling into the well; but not fixed in the masonry, to allow the well to be inspected at pleasure.

The well was in constant use, for the before specified purposes, and the water in it has risen to nearly the level of the earth, in consequence of the rainy season, (when most wells in the vicinity of the Bythákkhaneh rise to within a few feet of that level,) and the quantity of refuse daily thrown into it.

On Tuesday evening, the 30th August, a little before gun-fire, the copper strainer of the well was blown off, and a blaze issued from th.

aperture, (which several of my servants who were close to the well described as resembling flame produced by brimstone,) and covered both sides of the wall which separates the cook-room premises from those of the bottlekhaneh, and crosses with an arch over the well; it rose up in a sheet of flame to the top of the wall, and glided gently towards the door of the cook-room, and there vanished.

The servants, filled with dismay, came running to me, and reported what they had seen, on which I ordered a light to be introduced into the aperture of the well, which being done, it was instantly blown out, and a small blaze observed in the well near the aperture; but this effect did not take place on applying the light a second time. Next morning, on examining the well, it was found very offensive, in consequence, I believe, of my servants having contrary to my orders occasionally removed the strainer, and suffered rice and filth to enter the well, which was then in a state of fermentation, with rice visible on the surface. On examining the strainer, it had the appearance of having been scorched by fire.

After the alarm had subsided, a chokídar came forward, and stated that about fifteen nights previous to the event, he was on watch at the door of the bottlekhaneh at about mid-night, when he was alarmed by a similar appearance, which he did not mention, fearing he should not be believed.

I have since procured five pounds of chloride of lime, and mixed it with ten gallons of water, and poured the mixture into the well, which has nearly taken away every particle of offensive smell, and the well is now used as a receptacle for the refuse water of the bottlekhaneh.

A cess-pool in the yard of a very respectable coach building establishment in the town, seems to have shewn nearly similar phenomena to those reported of the cook-room cess-pool at Bythákkhaneh.

It is of considerable depth, built in the form of a well, and continued about 5 feet above the surface of the ground. One day a candle was let down, to see what effect the foul air would have on the flame, and whether it would continue to burn: it reached about 3 or 4 feet, before there was any perceptible change in the light; it was then with a sort of flash surrounded with a blue flame about a foot in diameter, but this rapidly diminished till it disappeared altogether. The candle was now gradually lowered, and as it descended it burned more and more feebly, and had it not been drawn rapidly up it would have been quite extinguished. As the candle was drawn nearer the mouth of the cess-pool, it again revived and burned perfectly bright, about 4 feet from the top.

The gas which had caused the blue flame seemed now all exhausted, as there was not the slightest appearance of the halo which surrounded the candle on its being first let down. The candle was again lowered, but had no sooner reached the surface of the soil below than it was extinguished.

The appearances above described are readily explained from the formation of carburetted and phosphuretted hydrogen from the decomposition of the vegetable and animal matter deposited in the wells: the heavy gas at the bottom was doubtless carbonic acid, formed by the combustion of the inflammable gases. The object of bringing the above facts to the notice of the public is to prove the great utility of the well system in a town situated like Calcutta, on a flat, and necessarily unprovided with common sewers. The experiment has been tried with success also in the barracks at Chinsurah and in Fort William, and in both the decomposition of the deposited matter is so rapid from the combined influence of the temperature and water, and from the multitude of living creatures which swarm within the wells, that there would, in ordinary circumstances or where the number of people resorting to them is moderate, seldom if ever be occasion to clean them out.

M.

V.—*On the Temperature and Saltness of the River Huglí, from Calcutta to the Sea.* By G. A. Prinsep, Esq.

Having had occasion to make frequent visits to Saugor Island, during the last four years, I usually availed myself of the spring tides, for greater expedition, and it was my practice to register the temperature and specific gravity of the river surface (the latter tried with a very sensible hydrometer) as I passed the Fort, Budge Budge, Fultah, and other principal stations both in going and returning, and especially to note the degree of saltness existing at the change of tide in whatever part of the river I happened to be. In this manner I have accumulated above 350 observations of temperature, and nearly as many of specific gravity, embracing all seasons of the year, but least copious in the rainy months. They may perhaps be worth recording, to assist the researches of some speculator in meteorological subjects, and to facilitate comparison with other rivers.

The following table contains a summary of the temperatures observed: the blanks of July have been filled up by estimate, in order to obtain a general mean.

TABLE 1.—Temperature of the River Hugli, from Calcutta to the Sea, through Channel Creek.

	Above Diamond Harbour.			At and below Diamond Harbour.			In Channel Creek.			Total No. of obs.	General mean.			
	No. of obs.	hight.	lowest.	mean.	No. of obs.	hight.	lowest.	mean.	No. of obs.			hight.	lowest.	mean.
January, 1830 and 1831,	7	71.	68.5	69.75	9	70.	68.	69.	6	72.	Md. Pd. 68.	70.	22	69.58
February, 1829, 1830, 1831, and 1832,	29	79.7	67.5	73.6	25	80.	68.	74.	27	82.	69.	75.5	81	74.37
March, 1829, 1831 and 1832,	10	83.5	69.	76.25	15	83.	69.	76.	12	84.5	72.*	78.25	37	76.83
April, 1830 and 1831,	17	88.	82.	85.	8	84.5	81.	82.75	5	85.5	83.	84.25	30	84.
May, 1829, 1830, and 1831,	19	90.	84.	87.	12	89.5	86.	87.75	11	89.5	86.	87.75	42	87.5
† June, 1822, 1830, and 1831	13	91.†	84.7	87.85	8	86.	84.5	85.25	2	84.5	84.	84.25	23	85.78
July, 1830,	6	88.	87.	87.5	0	88.	85.	86.5	0§	88.	84.	86.	6	86.67
August, 1831, (30th and 31st),	5	85.5	85.25	85.38	2	85.25	84.75	85.	5	85.	84.75	84.87	12	85.08
September, 1829, 1830, and 1831,	5	89.	84.5	86.75	7	89.	86.	87.5	5	88.5	86.	87.25	17	87.17
October, 1829, 1830, and 1831,	11	91.5	86.	88.75	7	90.5	85.	87.5	16	89.5	84.	86.75	34	87.75
November, 1829, 1830, and 1831,	10	84.5	76.5	80.5	8	82.5	78.	80.25	10	84.	78.	81.	28	80.58
December, 1829 and 1830,	9	74.5	70.	72.25	9	74.5	71.5	73.	6	76.7	72.	74.35	24	73.2
	141	84.68	80.47	81.71	110	83.55	78.9	81.23	105	84.14	79.23	81.68	356	81.54

* 28th February, 1831.—This is included, because, having quitted the Creek that day, I had no observations there in March, 1831, till the end of the month, when the lowest temperature was 81½.
 † The observations of June, at and below Diamond Harbour, were limited to the 26th, 27th, and 28th June, 1831, to which may be added one made at Kedgeree at 9 A. M. on the 10th June, 1822, after a violent storm, when the temperature of the river was 83½ at low water.
 ‡ At the Ferry off Paltáh Ghat, 20th June, 1822, at 7½ A. M. half ebb.
 § The temperatures of this month, at and below Diamond Harbour, are filled up by estimate.
 || All the observations of November were made between the 1st and 9th, inclusive.

Hence it would seem that the mean temperature of the surface water exceeds 81° Fahr. every where between Calcutta and the sea. The absence of observations during stormy weather, may have given some trifling excess to the apparent result; but as the mean of each month is taken from the extremes, and I was upon the river immediately after several violent storms and during many north-westers, and registered the temperature at sun-rise, as well as during the day, I do not think the true mean temperature is lower than 81. Indeed I should rather apprehend an error in the opposite direction; for in tropical countries I have remarked that the high temperatures, whether of the day, the month, or the season, are of longer duration than the low. A violent storm from the north has been known to depress the temperature to 50° Fahr. in January, at Vera Cruz (Lat. $19^{\circ}11'$); but in a few hours it rises again above 60° : whereas for months together the temperature there exceeds 80° ; but, except on very rare occasions, never passes 90° . The mean of the extremes of the year would thus give a temperature of only 70° for Vera Cruz, while the true mean, according to different observers, is between 79 and 81. In the climate of Calcutta, if we take the extremes at 50 and 100, we obtain a mean of 75 instead of the true mean 78; and in the preceding table, the extremes of the year, (91 and 68) give a mean 79.5, two degrees lower than that of the months duly cast out. I have observed also, that, although a thin surface of water may occasionally be brought to the freezing point by radiation in the still clear nights of winter, the hottest sun will not raise it to 110; which gives a mean of only 71.

It may seem extraordinary, that the temperature of a river should exceed that of the climate of the country through which it flows. I believe the reverse is generally supposed, on account of the cooling influence of evaporation, and I should take it to be so with the rivers of England. In tropical rivers, however, especially the Ganges, there is this peculiarity, that the whole, or nearly the whole supply is obtained at that season when the power of the sun is the greatest, and when the evaporation is very much reduced by the saturated state of the atmosphere. Hence the mass of waters has not time to cool very considerably, before the short winter is over; and when the sun begins again to act with power, their depth is at its minimum, and the sun's influence rapid in proportion. This difference of 2 or $2\frac{1}{2}$ degrees is, however, not much more than Humboldt remarked within the tropics upon the ocean, which, except where influenced by currents, he always found to be warmer than the air immediately above it. We have an example of the same fact in the Bay of Bengal, which, at a short distance to the southward,

preserves a temperature above 80° throughout the year, sometimes reaching 85° and 86° . I found the surface of the sea off Point de Galle 83° on the 22nd December, and 90° in May; the mean of these is far above the medium temperature of the climate. Other examples I could cite to the same purport. The rivers of Mexico and the Orinoco reach the temperature of 90 when the temperature of the air is much below that degree.

The second table exhibits the specific gravity of the river water at four places, from actual observations made at different seasons. There will appear some discordance among them, from the accident of my passing places at different states of the tide, and consequently not obtaining the maxima and minima at each place on the same trip. To obtain any thing like exactness in ascertaining the saltness of the river in each month of the year, it is obvious, that daily observations should be taken for a long period at many stations and at every change of the tide. There is great inequality of season in this particular: on the 31st October 1830, the specific gravity off Mud Point was 1006.5 at high water spring tide; whereas, in 1831, so late as the 6th November, it was but 1001. at the top of the springs.

But, although the observations I have collected are not sufficiently numerous to afford an accurate mean for each or perhaps any one point on the river, they may be employed to form a table of the whole by estimate. To ascertain the influence both of the tides and of the freshes, —the latter at one season pushing the sea water quite out of the river channel, upon which in the other season it constantly encroaches, until the water at Mud Point becomes almost as briny as at the Sand Heads, and a slight degree of saltness is perceptible even at Calcutta, — I drew out a table of distances from Calcutta, and inserted in columns for every month (repeated for each year of observation) all the observations of high and low water, with a few others when those were deficient. This would be much too confused and voluminous for your pages; but it has enabled me to prepare the following (third) table, which, although formed by estimate, and not by actual averages, is not likely to be very wide of the truth: indeed, I scarcely think the errors exceed .001 in any place. The zero, at the head of each column, represents the point at which saltness ceases to be perceptible at high and low water spring-tides. It will be seen, that the sea water gains a little in September when the freshes are the strongest; this is owing to the great rise of the equinoxial tides, which in the autumn are much higher than those of March, the average level of the sea being 3 to 4 feet higher in September, than it is at the end of the north-east monsoon.

TABLE 2.—Specific Gravity of the River Hugli at and below Phaltah, as observed.

	Phaltah.				Diamond Harbour.				Mud Point.				Ganga Sagor.				Total.		General mean.
	No. of obs.	highest.	lowest.	mean.	No. of obs.	highest.	lowest.	mean.	No. of obs.	highest.	lowest.	mean.	No. of obs.	highest.	lowest.	mean.	No. of obs.	mean.	
January, 1830 and 1831,	3	1002.8	1000.5	1001.65	3	1003.2	1002.1	1002.65	3	1007.9	1005.	1006.45	3	1016.5	1015.4	1015.95	12	1004.17	
February, 1829, 1830,	3	1004.6	1000.	1002.3	8	1008.	1000.5	1004.25	6	1013.8	1008.	1011.9	7	1020.1	1014.2	1017.15	24	1008.9	
1831, and 1832, . . .	1	0	0	1005.5	5	1007.5	1005.7	1006.6	4	1015.5	1010.	1012.75	5	1019.7	1018.5	1019.1	15	1011.	
March, 1829, 1831, & 1832	2	1006.3	1004.7	1005.5	4	1012.2	1008.2	1010.2	3	1018.5	1013.7	1016.1	1	0	0	1020.3	10	1013.05	
April, 1830 and 1831, . .	4	1009.4	1004.7	1007.05	8	1012.	1009.6	1010.8	4	1020.3	1013.9	1017.1	6	1023.	1022.	1022.5	22	1014.38	
May, 1829, 1830, & 1831,	1	0	0	1000.2	2	1002.4	1002.	1002.2	2	1013.6	1009.1	1011.35	1	0	0	1022.	6	1008.94	
June, 1831, (25th to 28th),	0	0	0	1000.	0	0	0	1001.	0	0	0	1004.	0	0	0	1015.	0	1005.	
neap tides,	2	1000.	1000.	1000.	1	0	0	1000.	1	0	0	1030.	*	0	0	1010.	4	1002.5	
July, (by interpolation,)	1	0	0	1000.4	1	0	0	1000.6	3	1001.7	1000.	1000.85	5	1013.5	1005.2	1009.35	10	1002.8	
August, 1831,	0	0	0	1000.	2	1001.2	1000.	1000.6	5	1006.5	1000.	1003.25	9	1013.	1005.	1009.	16	1003.21	
September, 1829, 1830,	0	0	0	1000.	4	1001.3	1000.4	1000.85	3	1001.8	1000.1	1000.95	7	1010.8	1009.	1009.9	15	1003.81	
and 1831,	1	0	0	1000.1	2	1001.6	1000.5	1001.05	3	1005.9	1004.	1004.95	4	1012.5	1012.	1012.25	10	1004.59	
October, 1828, 1829, 1830,	0	0	0	1000.	0	0	0	1003.4	37	0	0	1007.47	48	0	0	1015.21	141	1006.86	
and 1831,	0	0	0	1000.	0	1012.	1000.	1006.	0	1020.3	1000.	1010.15	0	1023.	1005.	1014.	0	0	
November, 1829, 1830, &	1	0	0	1000.	0	0	0	1002.	40	0	0	1003.4	37	0	0	1015.21	141	1006.86	
1831,	1	0	0	1000.1	0	0	0	1004.7	0	1009.4	1000.	1004.7	0	0	0	1015.21	141	1006.86	
December, 1829 & 1830,	0	0	0	1000.1	0	0	0	1004.7	0	1009.4	1000.	1004.7	0	0	0	1015.21	141	1006.86	
Number of observations	19	0	0	1002.	40	0	0	1003.4	37	0	0	1007.47	48	0	0	1015.21	141	1006.86	
and their mean,	0	0	0	1004.7	0	1012.	1000.	1006.	0	1020.3	1000.	1010.15	0	1023.	1005.	1014.	0	0	
Extremes observed and																			
their mean,																			

* At the mouth of the Duragra, the specific gravity of the water in the neaps was 1001.7 at $\frac{1}{4}$ ebb, and 1000.8 at low water, on the 31st August, 1831.

TABLE 3.—Estimated Specific Gravity of the River Húglí, from Calcutta to the Sea, through Channel Creek, at High and Low Water, Spring Tides.

Distance fr. Calcutta.	Place.	Jan.		Feb.		March.		April.		May.		June.		Aug.		Sept.		Oct.		Nov.		Dec.	
		H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.	H. W.	L. W.
0	Calcutta, ..																						
5	Garden Re.																						
10	Ak ra, . . .					0,1		0,3		0,6		0,6		1,0		1,7		0,4		0,6		0,6	
18	Bajbai, . . .			0,5		1,0		0,2		0,8		0,8		0,2		0,2		0,8		1,0		1,0	
22	Uiyabaryá,			1,0		1,5		0,5		2,5		2,5		1,0		0,4		1,0		3,0		3,0	
24	Achípúr, ..			1,2		0,3		1,6		2,7		1,1		4,0		0,5		4,0		2,5		2,5	
27	Mayapúr, ..			1001,0		0,2		2,0		3,0		1,3		5,0		7,0		5,0		3,0		3,0	
35	Phaltab, ..			1002,0		0,5		3,5		6,0		3,5		9,0		1,0		9,0		5,0		5,0	
39	Damúda R.			1002,5		0,7		4,0		7,0		4,0		10,0		1,5		10,0		6,0		6,0	
43	Rápnarain,			1003,0		1,0		4,5		8,0		5,0		11,0		2,0		11,0		7,0		7,0	
50	Diamond H.			1004,0		2,0		6,5		3,0		8,0		5,0		4,0		5,0		10,0		10,0	
60	Kalpí, . . .			1005,5		3,0		5,0		4,0		11,0		7,0		6,0		14,0		15,5		12,0	
65	Rangafallah			1006,5		4,0		10,0		6,0		12,0		8,0		8,5		15,0		17,0		13,0	
70	Silver Tree,			1007,5		5,0		12,0		7,0		13,0		9,0		12,0		18,0		18,0		14,0	
73	Mud Point,			1008,0		6,0		13,0		8,0		14,0		11,0		14,0		17,0		19,0		15,0	
75	Young's P.			1009,0		7,0		13,5		9,0		14,5		11,5		15,0		19,2		16,0		16,0	
80	Comt. Cr.			1011,0		9,0		14,0		10,0		16,0		13,0		16,0		19,5		17,0		17,0	
83	Bhagwa K.			1012,0		10,0		15,0		12,8		17,0		14,0		17,5		20,0		15,0		15,0	
87	Dúragra, ..			1014,0		12,5		17,0		14,0		19,0		16,5		19,0		21,0		19,0		17,0	
91	Arhai Bán.			1015,0		13,5		18,0		15,0		20,0		18,0		20,0		22,0		20,0		18,0	
95	Sát Bánkee			1017,0		15,0		19,0		17,0		21,0		20,0		22,0		23,0		22,0		20,0	
97	Ganga Sárg.			1017,0		15,5		19,5		22,5		24,0		22,0		24,0		24,0		24,0		20,0	
100	Edmondst. I.											27th June,		1831.		22,0		24,0		27th June,		1831.	

The numbers in this Table, with the exception of the first column, are to be added to 1000 to express the specific gravity. ○ represents the point where the river water may be esteemed perfectly fresh.

No observations made in July.

6th Dec.

VI.—SCIENTIFIC INTELLIGENCE.

[Extracts from European correspondence, communicated
by G. Swinton, Esq. Calcutta.]

I.—*Burmese Varnish.*

“I have long been putting off writing to you in the hope of being able to give you some intelligence regarding your black varnish, which I was in great hopes would have been considered an important acquisition to the arts. I have however been baffled in all my attempts to get what I should consider a fair trial made of its merits. All the artists employed in the varnishing and japanning business are so wedded to their common routine and to the manipulation of materials which are familiar to them, that I have found great difficulty in getting trials made, and have very little confidence in the statements made to me of the results. I am not losing sight of the matter, however, and have still hopes of getting a trial made on a considerable scale by a great house at Birmingham. The managing partner of this house honestly told me, that although a better varnish than that which they now use were to be offered to them for nothing, they could hardly bring it into use, if it presented any considerable difficulties in its application, as that which is now prepared from Coal-tar, besides being so cheap (2s. per gallon), is easily worked, and produces the most beautiful skin imaginable. The beauty of the higher kinds of papier-maché ware is now very remarkable, and except in some of the gold ornaments, surpasses the best specimens of Chinese manufacture. It has occurred to me that canvas prepared in this way with your varnish would make indestructible grounds (as far as damp is concerned) for oil paintings.

A varnish has been discovered at Paris, which is used for preparing canvas and oak for painting on; it is of a most durable nature, and is sold in prepared squares of any dimensions.

2.—*Fishes of the Ganges.*

“I spent some time in Paris this summer, and saw a good deal of M. Cuvier. I used the freedom of mentioning your name to him, and your desire of taking advantage of your position to forward the interests of science. I asked him if there was any particular object in natural history which I might suggest to you as a desideratum, which could be supplied from India. He immediately replied emphatically, “Ah certainement, les poissons d'eau douce;” he added that some gentlemen in Calcutta had already sent a good many of those of the lower rivers and parts of the country, but that they had no accounts of those of the higher parts.

3.—*Carton-pierre.*

Along with this I shall send a packet containing some letters, which I have received from persons with whom I had correspondence about your specimens. I have added one which I got a few days ago from a civil engineer now in Paris. It contains some account of a substance (Carton-pierre), which I think peculiarly calculated for forming ceilings for Bangalos, and even for the best pukka houses in India; it forms pannels or compartments of any size, and could with great ease be put up between the beams of the ceiling. The art of making the carton-pierre was lost in France for 300 years: it is as white as marble, but much lighter: there are some curious accounts of it in the Memoirs of the Academy of St. Petersburg. Its composition is kept a secret here. The following is extracted from a French journal.

“L'art d'exécuter en carton des ornemens de cette substance florissait en France au seizième siècle. La perfection à laquelle il était parvenu à cet époque est attestée par les beaux plafonds qui décoraient au Louvre les appartemens du Roi Henri II.

Cet art se perdit ou du moins restait dans l'oubli pendant près de trois siècles. On en vit reparaître, à l'exposition de 1806, quelques produits qui furent présentés par M. Gardeur. Ils étaient exécutés avec une pâte à laquelle on donne le nom de carton pierre: En 1819, M. Huseh recut une médaille de bronze pour de nouvelles applications de cette substance; mais jusque là tout ce borne encore à d'heureux essais. Il était réservé aux artistes dont nous allons parler de relever complètement cet art, et de lui donner même un nouvel éclat.

Ces artistes, qui se suivent de très près, malgré quelques légères différences dans la manière de préparer le carton-pierre, parviennent à mouler cette substance avec une telle perfection, qu'ils obtiennent de suite, et sans reparaître, les contours les plus nets et les surfaces les plus unies.

De belles épreuves de statues rappelant toute la grâce, toute la pureté et tout l'esprit des originaux, des ornemens du meilleur goût, offrant tout le relief et tout l'effet pittoresque de la sculpture, des candelabras, des colonnes, des entablemens profilés avec une grande pureté, prouvent que le carton-pierre est susceptible, entre les mains des hommes habiles dont nous parlons, de reproduire fidèlement les inspirations du statuaire, et de se prêter, avec une facilité merveilleuse, à l'exécution des conceptions les plus délicates ou les plus grandioses de l'architecture, pour la décoration des intérieurs."

4.—*Progress of Improvement in France.*

Statistics.—Since the peace, France has increased three millions; she has now about 33 millions of people, about 7,000,000 of families, and there are in this population four millions of small proprietors residing on their properties. France is improving rapidly. When the whole of the woodlands are converted into arable, and coal used instead of wood, France may easily carry a population of sixty millions of people.

The price of land carriage is about four pence per mile per ton; in America about two shillings and one penny; in Ireland about four or five pence. Iron sells in France for £18 per ton;—in London for £7—in Wales for £6—Raw Sugar is raised here from Beetroot at 8 sous per lb. and it is considered that it will be raised for 6 sous per lb. France has doubled her consumption of Iron yearly within these few years.

Arts.—The instrument-maker, M. Gambey, has invented a new level, which Mr. Arago praises extremely, and the great circle which he is now making for Brussels, is a model of execution. You would have been astonished at the fine divisions cut in the limbs of all his instruments, exceeding any thing of the kind to be seen in London. I have been to see the sawing machine, which gives twenty-five cuts of timber in one inch; and the snuff mill, which manufactures one ton of snuff in an hour; it is driven by a thirty-six horse-power engine. The composition with which they paint the names of the streets is volcanic and quite monumental, it would be valuable for Edinburgh and other places in our country. The beautiful ladies combs now so much in fashion are made of the prepared horn hoofs of oxen: this manufacture is, I believe, hitherto unknown in England. The French are succeeding with the Cashmîr Goats, they have now about two hundred or upwards in excellent thriving condition.

5.—*Mode of conducting the Meetings of the Academie.*

A very interesting letter was read before the Institute by Gay-Lusac. It was from Humboldt, and was addressed to Arago;—the letter related to Humboldt's late journey into Siberia. Last Monday, a most important paper was read before

the Institute by Brongniart, on Geology, in which some new doctrines were advanced, which were opposed by Cordier; the discussions on this subject became very animated.—Cuvier read a paper on the objects of Natural History, which had been collected by the naturalists who accompanied Captain Dumont d'Urville in his late voyage round the world.—M. Mathieu read a small paper regarding the invention of a new instrument for measuring distances on paper, and also for protracting distances correctly on maps: the instrument is extremely simple, and I think it will be of great use to the graphic art.—He also read a paper lately, describing an Instrument for drawing parallel lines: I have not seen this instrument. The Institute is the most interesting place I ever frequented, there is always something new; all the members are educated, scientific men, eminently distinguished in their several departments, well qualified to judge of whatever may come before them; there is no dross or rubbish, the entire body is solid and pure.'

6.—*Caoutchouc.*

[From the Journal of the Franklin Institute.]

We have received from the above-named gentleman some account of his experiments on the distension and inflation of Caoutchouc; he has also read a paper upon the subject before the American Philosophical Society, and several notices respecting them have likewise appeared in the daily journals. We may probably hereafter lay some further details before our readers. The communication referred to contains the following information:

MODE OF MAKING GUM ELASTIC INTO BAGS, SHEETS, &c.

Soak the gum elastic in sulphuric ether until soft, and almost inelastic, which in good ether will take from 10 to 24 hours. Then, if it is a plate, cut it with a wet knife, or parallel knives, into such sections, or sheets, or shapes, as may be desired, and suffer them to dry; or if a bag, apply a pipe or stop-cock, and inflate with the mouth rapidly. If the bag should expand equally, more slowly; and with occasional pauses, if unequally. By such means a bag may be made so thin as to become transparent, and light enough to ascend when filled with hydrogen. By graduating the extent of inflation, sheet caoutchouc of any given thickness is produced. If for blow-pipes, or other purposes, for which it is desirable that the bags should possess contractility, let them be inflated to the desired size and after an hour let out the air. Ever afterwards they will suffer as great a degree of extension, and again contract. If permanent sheets are wanted, the inflated bags are to be hung up until dry, after which no sensible contraction will ensue.

Caoutchouc softened by ether may be readily stretched by hand, over lasts, assume the shape desired, and may, therefore, be applied to a variety of useful purposes. In the form of straps and twisted strings, its elasticity offers many useful applications. It may be made to assume the form of a tube, to connect parts of chemical and other philosophical apparatus with each other; may be employed as covers for hottles, corks, &c. and indeed wherever the passage of steam, or air is to be prevented. It is also susceptible of numerous applications in medicine and surgery.

Mr. Mitchill has extended a bag which was not above the size of a skinned English walnut, and which weighed three drachms and a half, until its diameters were 15 and 13½ inches respectively. Larger bags have been made to attain a diameter of six feet; one of these when filled with hydrogen, escaped, and was found at the distance of 130 miles from the city. Balloons so formed have been exhibited before the several classes attending chemical lectures in Philadelphia.

The discovery, by the same gentleman, that essential oil of sassafras will soften caoutchouc so that it may be applied to any surface with a brush, promises also much utility. When dry it becomes again simple caoutchouc, with all its original elasticity; if it be applied on a plate of glass, dried, and then immersed in cold water, the sheet may be peeled off. It has been spread upon paper, and after becoming dry, the whole immersed in water, when on stretching it, the paper would, of course, separate into fragments, between which the gum elastic might be stretched, so as to separate them to the distance of a quarter of an inch without itself giving way, notwithstanding its tenuity; such a varnish will never crack, one of its essential attributes being elasticity.

7.—*Directions for collecting and preserving Plants in foreign Countries.* By W. J. Hooker, LL.D. Reg. Prof. Bot. at Glasgow.

ON PRESERVING PLANTS FOR A HORTUS SICCUS.

This is a much simpler process than is generally imagined by those unpractised in it; and many travellers have been deterred from collecting specimens by the time and trouble requisite for securing them in the way that has been generally recommended.

The main circumstances to be attended to are, to preserve specimens of plants in such a manner that the moisture may be quickly absorbed, the colours as much as possible preserved, and such a degree of pressure given to them, as that they may not curl up in the act of drying.

For this purpose, let a quantity of separate sheets of paper be obtained, of a folio size, and of an absorbent nature. Common cartridge or gray paper is perhaps the best. Brown paper does well enough for coarse plants, and blotting paper for the more delicate kinds. Two boards should be provided, one for the top and the other for the bottom of the mass of papers. For pressure at home, or when stationary for any length of time in a given spot, nothing serves better as a press than a weight of any kind, a large stone, a great book, &c. put upon the topmost board; and the great advantage in this is, that the weight follows the shrinking of the plants beneath. Whilst travelling, nothing is so convenient as three leathern straps with buckles—two to bind the boards transversely, and one longitudinally. It will be farther desirable to have a number of pieces of pasteboard, of the same size as the paper, to separate different portions of the collection, either such as are in a different state of dryness, or such as, by their hard or stout woody nature, might otherwise press upon more delicate ones that are in papers adjoining, and be the means of injuring them.

Thus provided, gather your specimens: if the plants be small, root and stem; if large, cut off portions of the branches of a foot or a foot and a half long, selecting always such as are in flower, and others in a more or less advanced state of fruit. Place them side by side, but never one upon another, on the same sheet, and lay upon them one, two, or three sheets, according to the thickness of your paper or of your plants, and so on, layer above layer of paper and specimens, subjecting them then to pressure. As soon as you find that the paper has absorbed a considerable portion of the moisture, (which will be according to the more or less succulent nature of the plants, and the heat and dryness of the season or climate,) remove the specimens into fresh papers; and let the old papers be dried for use again, either in the open air and sun, or in a heated room, or before the fire.

As to the spreading out of the leaves and flowers with small weights, penny pieces, &c. it is quite needless. The leaves and flowers are best displayed by nature in

the state in which you gather them ; and they will require little or no assistance with the hand, when laid out upon papers, to appear to the best advantage ; especially if put in carefully on being fresh gathered. If the specimens cannot be laid down immediately upon being collected, they should be preserved in a *tin box*, where they will keep fresh for a day or two, if the atmosphere be not very much heated.

Some very succulent plants, such as **CACTI**, **SEMPERVIVA**, **SEDA**, **ORCHIDEOUS PLANTS**, &c., some plants with very fine but rigid leaves, such as the **FIR** tribe and the **HEATHS**, and some with compound pinnated leaves, require to have the specimens plunged into boiling water for a few seconds before they are pressed ; this greatly facilitates the operation, by destroying the vegetative principle and preventing the leaves of many from falling off in the act of drying. In this case, the superabundant moisture should be absorbed by a cloth, or by applying, temporarily, pieces of blotting paper.

In most parts of Europe, and in all countries not oppressively hot, it is a good plan, and saves much paper, to lay out the specimens on their respective sheets, on the floor of a chamber during the night, or for five or six hours during the day, putting them up again and submitting them to pressure, as before, on the same papers. By this means, much humidity both from the plants and the paper is absorbed by the atmosphere, and the colour is better preserved. If, however, the climate be hot, a much shorter time will suffice, or the leaves will shrivel.

When sufficiently dry*, which with the greater number of plants, and in warm climates, will take place in the course of a few days, (and with two, or at most four shiftings of the specimens,) they should be placed between dry papers, one sheet of folio between each layer of plants ; and they are then ready for transportation, either packed up in boxes, or well secured as a parcel, covered with oil-cloth. A great many specimens may thus be sent in a very small compass.

PALMS having their fructification, and their leaves very large, are with difficulty subjected to pressure. A few of their flowers should be pressed ; and the cluster of fruit and a leaf may be simply dried in the air, and afterwards packed in boxes for transportation.

FERNS and **MOSESSES**, and the larger proportion of **CRYPTOGAMIC PLANTS**, may be dried in the common way ; such Mosses as grow in tufts, being separated by the hand.

SEA-WEEDS should be immersed for some hours in fresh water before they are dried ; and common blotting paper is the best for absorbing the moisture from these plants.

If the **FRUITS** of plants are of a small size, so as to be preserved in a Herbarium, they should be gathered with the leaves and branches, as are the flowers. If of a large size, they should be kept separate. **DRY FRUITS** demand no care, except those which split open by means of their valves. These require to be tied round with a little packthread.

PULPY FRUITS are only to be preserved in spirits of some kind, and they should have a number attached to them, referring to the flowering specimens.

The best way to introduce plants from abroad into our country is by seeds. These should be gathered when perfectly ripe ; and if a number of each kind be

* The being sufficiently dry may be ascertained by the stiffness of the stems and leaves, and the specimens not shrinking or curling on being removed.

folded in a separate piece of paper and kept dry in a box, they in general reach this country in a good state for vegetation.

OILY SEEDS, such as those of the **TEA**, **COFFEE**, most kinds of **ACORNS**, &c soon lose their germinative property. For such, it is necessary to provide a box and a quantity of loose sandy or peat mould. Put into the box a layer of this earth and then a layer of seeds, and so on alternately till the box be full.

BULBS of all kinds, and many **ROOTS**, not actually in a state of vegetation, cuttings of **SUCCULENT PLANTS**, **ALOES**, **CACTI**, and many other thick-leaved **PARASITIC ORCHIDEOUS PLANTS**, called **AIR PLANTS**, may be put into a box with dry sand, peat, or saw-dust; and these (as should the seeds and bulbs) must be kept free from damp.

Plants that it is desirable to remove with the **ROOT**, should be carefully placed together, but not too crowded, with common soil, in wooden boxes, the top of which is formed with two sloping sides like the roof of a house; one of these constitutes a lid that can be opened or shut at pleasure, so as to admit the air and water, and especially so as to exclude the spray of the sea, which would be highly prejudicial. The earth must be kept moderately moist, and the boxes always placed either on an exposed part of the deck of the vessel, or slung from the *tops*. In the latter situation they are liable to the least injury; only the person who has the charge of them must not forget to supply them with fresh water when they may require it.

With the plants and seeds, whether in a living or dry state, if they are not well known to naturalists, there should be pieces of paper, on which are to be indicated the uses of the kind as far as they have been ascertained, the particular country where it is gathered, the soil, the size, the elevation at which it grows above the level of the sea, and the name it is generally known by.

As soon as a sufficient number of plants are collected, no time should be lost in transporting them to their place of destination, since the dried specimens in particular, and the seeds, are liable to the attack of insects in warm climates; and the captain of the vessel should be particularly requested to keep them in a dry and airy part of his vessel.

Specimens of the **WOODS** are also highly desirable; of the **GUMS**, **RESINS**, and the various products of the trees, if employed in the arts or in medicine; and it may here finally be remarked, that those plants which are employed *as useful* in any way whatever by the natives, are what it is of most importance to possess in our gardens: nevertheless, the more common kinds, the very weeds of foreign countries, the **Grasses**, the **Mosses**, the **Sea-weeds**, and **Lichens**, will prove extremely valuable to a scientific Botanist.

8.—*Explanation of the Sketches of the Horns of the Jarāi, Plate V.*

[Described in the last number, page 66.]

1, 2, 3. The *Phúro Jarāi*, mature. No. 1 has the upper antler or process, posterior and internal; No. 2, the same antler, anterior and external; No. 3, shews it doubtful. In No. 1, this same superior antler is remote from the end of the beam; in Nos. 2 and 3, it is approximated.

4. The *Ráto Jarāi*, mature.

5. The *Kálo Jarāi*, mature.

Dimensions.	Feet and inches.				
	1.	2.	3.	4.	5.
Length along the curve,	2 10	2 6½	2 10¼	2 1¾	2 8¾
Utmost divergency,	1 11	2 1¾	2 5	1 8½	2 5¾
Divergency of tips,	1 11½	2 1	1 11¾	1 2	2 1
Circumference of base above the burr,	0 8	0 8½	0 8½	0 7¾	0 6¾

VII.—*Proceedings of Societies.*

1.—ASIATIC SOCIETY.

Wednesday, 7th March, 1832.

The Hon'ble Sir C. E. Grey, President, in the chair.

The President announced to the meeting the request of the Editor of the *Gleanings of Science* to continue that publication under the designation of the *Journal of the Asiatic Society*.

Resolved, that permission be granted, to be continued as long as the publication is under the charge of one or both the Secretaries of the Society.

Read a letter from Mr. Goodhull, presenting drawing of a fossil shell.

Read a letter from Captain Mitchell, forwarding to the Museum a Bish Copra in spirits.

Read a note from Bahoo Radhacant Deh, presenting a young Pigeon with two heads, for the Museum.

The Meteorological Registers for November and December were presented by the Surveyor General.

Mr. F. Royle displayed to the Society a portion of the collections made by him while superintendent of the Seháranpúr Botanic Garden, in the various branches of Natural History, and proceeded to illustrate the objects of his researches by a general review of the climate, the geology, the botany, and the zoological productions of the part of the country he had just quitted.

Such of his remarks as had not solely reference to the objects under inspection by the Society, have been selected for publication in the present number: Upon the termination of his interesting address the President rose, and moved the thanks of the Society in the following words.

“ I am sure that I only express what is felt by the Society, when I say that we greatly regret we have nothing better to offer to Mr. Royle than a vote of thanks in return for the gratification and instruction he has afforded us, or whereby we can signify the opinion which we entertain of his meritorious services in the cause of science. Other collections of greater magnitude have gone home from India. In the department of botany we know how vast and precious a freight was borne across the sea by our zealous and indefatigable friend Dr. Wallich, and with how much admiration the display of it has been hailed in Europe. Other cabinets of great merit, and, perhaps, more complete than this of Mr. Royle's in single branches of Natural History, have been formed of late years; but I am not aware of any, certainly not of any which has been freely submitted to the examination of our Society, which has been of equal variety, curiosity, and interest with that which is now open before us. Here are new acquisitions in the zoology, ornithology, entomology, and geology of northern India and the Himalaya; and in the scientific observations by which we have heard them explained and illustrated this evening, we find an error of the learned and celebrated founder of our Society corrected; familiar and household words of the existing races of India and Persia identified with the terms of the *Materia Medica* of Dioscorides, and the first annunciation of important geological discoveries by a friend of Mr. Royle's in continuation of his own researches, which promise to bring the fossils of India, so recently supposed to possess none of those primæval records, into curious and interesting comparison with the vast stores of Europe and America.

“It is peculiarly gratifying to myself to have had the duty of offering our thanks on this occasion, upon account of my having before seen this museum in that glorious region, to which it owes its existence, and having been indebted to Mr. Royle both for his civility in permitting me to inspect it, and for the pleasure and surprize of finding in the Botanic Garden, at Seharanpúr, the English daisy, looking up from the plain of India to the lofty snows of the Himalaya.”

Resolved, upon the motion of the President, seconded by Dr. Carey, that the Society, in tendering their thanks to Mr. Royle for the inspection of the extensive and interesting collections submitted by him to the Meeting, and the remarks illustrative of them, feel it incumbent to express their regret that any acknowledgments they can offer are an inadequate return for the gratification and instruction they have received.

And further that the Committee of Papers he requested to consider whether a letter may not be addressed to the Honorable the Court of Directors, introducing to their notice the labours of Mr. Royle; and if they deem it expedient, to prepare a letter accordingly for Mr. Royle to carry with him.

2.—MEDICAL AND PHYSICAL SOCIETY.

3rd March, 1832.

The following gentlemen, formerly proposed, were elected Members of the Society:—Messrs. Shirreff and Holmes, Assistant Surgeons, Bengal Service; Mr. Oxley, Assistant Surgeon, Sincapore; Mr. Richards, Surgeon, 8th Madras Light Cavalry, and Dr. J. N. Casanova. J. C. Boswell, Esq. Assistant Surgeon, at Penang, was proposed as a Member of the Society, by Mr. Hutchinson and Mr. Twining.

The following communications were then laid before the Society:

1.—A letter from Colonel Tod, presenting to the Medical Society, through Dr. Craigie, various objects of Natural History, from Van Diemen's Land. These consisted of some Lignites, two specimens of *Ornythorynchus Paradoxus*, and a variety of Birds. The thanks of the Society were voted to Colonel Tod, for his valuable present; and a Committee was requested to examine the several articles carefully, for the purpose of selecting such specimens as cannot be preserved in this country, and having them transmitted to England, while in a good state of preservation.

2.—Additional communications from Dr. Mylne, of Bomhay, relative to *Dracunculus*, in confirmation of the opinions already advanced by him on that subject.

3.—A case of Disease of the Heart, drawn up by Mr. Spurgeon, and forwarded by Dr. Thomas, through the Medical Board.

4.—An Essay on Hospital Gangrene, by J. L. Geddes, Esq. of the Madras Medical service.

5.—Two cases, in each of which both the common Carotid Arteries were tied; by Mr. Preston of Cuddalore.

6.—An account of the Medical Topography of the Nielgherry Hills, and the influence of that climate on healthy and on impaired European constitutions, by Dr. Baikie.

7.—Remarks on *Dracunculus*, by Dr. Smytten, of Bomhay.

8.—A Medical Report relative to the station of Gowliattie, in Assam; and an account of the diseases which have recently prevailed in that district, by G. Lamb, Esq. of Dacca, presented by the Medical Board.

9.—A report by J. C. Boswell, Esq. on an Opiate recently used at Penang. This medicine was made by digesting solution of tartaric acid in water on the dregs remaining after the tincture of opium has been prepared. Only a small quantity of this Penang Opiate was received, and it was tried by Mr. Twining, who reported that it appeared to possess considerable efficacy; its anodyne and soporific properties being estimated at about half the strength of Vinum Opii.

10.—Mr. Royle's paper, in pursuance of his proposal formerly laid before the Society, with a view of promoting the collection of a complete cabinet of specimens of the *Materia Medica* of Hindústan. The author considers his inquiries merely as preparatory to a complete investigation of the *Materia Medica* of India; which investigation he would wish to comprise, not only an inquiry as to the plants which produce each article; but would desire to see the real properties of the medicines ascertained by the most careful experiments, which, of course, can only be accomplished by the united labours of the Members of the Society, at some remote period: for the present, Mr. R. brought for inspection of the Society arranged specimens of nearly a thousand articles of *Materia Medica*, with an herbarium, containing the plants, from parts of which many of the articles are produced; and for the purpose of facilitating the labours of others, he stated the mode which he adopted to procure the specimens now laid before the Society. In the first place, he collected the various articles of *Materia Medica* procurable in the bazars, and then employed *Kubarees* to bring in the plants which produced the respective medicines; by this means he was enabled to ascertain the Botanical names of many of the plants indigenous at several stations.

In investigating the medicinal properties of the several articles, the author observes, that we may be somewhat guided by the sensible properties of the medicines: and no slight assistance may be obtained by reference to the natural families to which the plants belong—for instance, the *Convolvulacæ* afford the Jalap, the Scammony, the Toorbud, (*Convolvulus Turpethem*) and several Indian purgatives. The *Asclepiadæ* afford emetic medicine, as the *Ipecacuanha* of America, and *Asclepias Vomitoria*, and *Asclepias Asthmatica*. The *Coniferæ* in India, as in Europe, yield Turpentine. The *Euphorbiacæ* yield Euphorbium, and the *Jatropha Curcas* (Barbadoes Nut), and in India, the Castor Oil, and the *Croton Tiglium*, the latter affording an acrid oil of highly active properties. The *Labiatae* in both countries possess aromatic and heating properties; while many of the *Solanæ* are poisonous. The *Gentianæ* being all bitter; the *Rubiaceæ*, mostly astringent, and the *Umbelliferæ*, aromatic. In fact, a very extended accordance may be observed in the sensible and medicinal properties of a large proportion of each of the natural families into which plants are divided. In preparing his MSS. the author states that he commenced by adopting the alphabetical arrangement of the Persian authors, inserting first the Asiatic names and synonymes: then the Greek names, followed by the Botanical name, the class, and order, according to the Linnæan system, and the natural order of the plant; after which he notices the country whence the article is said to be procured, the part of the plant which is used, and the medical properties ascribed to it by the *Hakíms*, or stated in their books, with some general remarks tending to identify the article. Separate lists contain the medicines belonging to the mineral and animal kingdom.

The 100 specimens of *Materia Medica* promised formerly by Mr. Royle, are deposited in the cabinet: and Members of the Society, at the different stations, are invited to collect and contribute such articles as may be peculiar to that part

of the country where they are stationed. If each Member of the Society would carefully make a series of experiments to ascertain the medicinal properties of the drugs which he collected, when used by natives, as well as by Europeans, and forward to the Society a concise account of the same, much useful information would soon be obtained, which might be printed in an arranged series in the Society's Transactions.

Mr. J. C. Boswell's medical report and cases were then read, and discussed by the Meeting.

3.—NATURAL HISTORY SOCIETY OF THE MAURITIUS.

[Extracts from the Proceedings of the 17th May and 14th June, 1831.]

M. Lienard, Sen. read a description of two fishes of the island: one, of which a drawing was presented, known by the fishermen as the *Battoir*, not offering the distinctive characters of any of the known genera of the family of *Percoides*, to which it apparently belongs, has received provisionally the name of *Platésome*. The second, commonly called *Lion mâle*, is a *Holocentre*, but not the *Holocentre Samner* of CUV. and VAL. neither of these species are described in the tables.

Mr. J. Lienard presented an account of a crab of the genus *Portune*, accompanied by a drawing. Also a description and drawing of an *Acanthure* very rare in those seas.

Mr. Faraguct presented and explained his table representing geometrically the law of the temperature of the seas at different depths; it is founded on the experiments made on board the *Astrolabe*, the only ones of the kind upon which confidence can be placed. It was found that at a depth of 820 brasses (fathoms) to which the lead attained, the temperature was 6.4 Cent. (43° Fahr.) and that the curve representing the results is a parabola of a high order, having for asymptote a vertical corresponding to a temperature of 4 or 5° centigrade, (40 Fahr.) At the depth of 1000 brasses (fathoms) a brass cylinder of 3 lines thick (containing the thermometer?) was broken, which is not surprising when the pressure is calculated.

Mr. J. R. Barry communicated a note on the subject of the temperature of mines of different depths. By observations made in Cornwall, in 1815, it was ascertained that at 1400 ft. Eng. below the surface, the temperature of mines exceeds that of the surface of the globe 28° Fahr. and that the heat augments progressively in descending at the rate of 1° for 65 feet.

Mr. J. Desjardins, Sec. read some pages relative to certain races inhabiting the Mauritius and Bourbon.

Also, conjointly with Mr. L. Bouton, Mr. J. D. read a notice of the Naturalist Commerson, well known as the principal contributor to the knowledge of the natural history of the island. Mr. J. D. treated of his zoological labours, while Mr. L. B. gave details of his life and works in general.

Commerson came to the island in 1768, and remained with M. de Bougainville to study its productions. He enjoyed greater means of research than any since his time. After a voyage to Bourbon and Madagascar, he returned to Mauritius, where he died on the 3rd March, 1773, at a place known by the name of *la Retraite*.

Mr. Ch. Telfair, president, presented 40 birds from Tasmania.

Mr. Lisset-Geoffroy offered for the library, the analyses of the Royal Academy's Proceedings from 1812 to 1829.

Mr. E. Baker, who had sent several manuscripts from Madagascar, on different subjects, was admitted a corresponding member of the Society.

